Shipbuilding in U.S. Declines-II

Shipyards National Asset—Sources of Business—Higher Cost in American Yards—Seriousness of Navy Yard Competition—Encourage Shipbuilding

By H. G. Smith
Vice President, Bethlehem Shipbuilding Corp Ltd.

SHIPYARDS are an important national asset. Without them it would have been impossible to have built and kept in operation the vast fleet of ships for both the navy and the Emergency Fleet Corp. required during the World war. The older shipyards were taxed to their capacity in building new vessels for the navy and Fleet corporation, and in addition many new yards sprang up like mushrooms and participated in ship construction. The private ship repair yards also performed an essential national service by reconditioning and repairing vessels for the Emergency Fleet Corp. and performing work in the value of $73,000,000 for the navy.

Sources of Shipyard Business

The private yards depend for their new construction upon

A—The navy and coast guard,

B—The shipping board,

C—The private shipowner.

Five navy contracts totaling about $50,000,000 have recently been placed with private shipyards, but they are the only contracts of this character that have been placed during the past seven years.

The shipping board has not made a contract for new ship construction during the past seven years; it has, however, contracted for the reconditioning of a few of its vessels and even on several of these the work has been performed by the navy yards at an expenditure of several million dollars.

As previously stated, including contracts for the construction of passenger, combination and cargo vessels, tankers, yachts and seagoing dredges, contracts for the construction of only 86 merchant vessels have been placed with five shipyards during the past seven years, or an average, during each year, of less than two and one-half vessels for each yard.

Merchant vessels may be separated into three important groups, as follows, viz:

A—Vessels for coastal and intercoastal service.

B—Vessels for lake, sound, river, harbor and canal service.

C—Vessels for the foreign trade.

Vessels for the coastal and intercoastal trade are protected by our coastwise laws, which require them to be built in the United States. Such vessels are seagoing and constitute the present nucleus of our merchant marine.

Vessels for the lake trade, which are seldom operated on the high seas, are likewise protected by the same laws if engaged in trade between United States ports and are built in yards on the Great Lakes. The shipyards on the Great Lakes compete only to a limited degree with yards on the sea coasts.

Vessels for sound, river, harbor and canal service, usually of small tonnage, are built in the United States and are not sufficient in number to be an important factor in shipyard output.

Navy Yards to Compete

Of the sixteen naval vessels authorized in the naval building program, eight are to be built in navy yards under an amendment made in the house of representatives March 16. In all fairness, this seems to be a particularly stupid or purely political move on the part of congress. If the shipyards of the country are to continue in order to provide facilities for naval construction as needed they certainly should be encouraged by receiving from the government such work as may be contemplated.

Higher Cost in American Yards

Vessels for the foreign trade may be built either in the United States or in a foreign country. If built in the United States for an American owner, they must fly the American flag. If built abroad they may fly either the American or a foreign flag. Such vessels are seldom built in the United States because their cost of construction is much greater in a domestic shipyard than in any foreign shipyard. In fact there are no vessels for the foreign trade now building in the United States.

The National Council of American shipbuilders has recently conducted an investigation of the relative cost of constructing similar vessels in Great Britain and in the United States. The investigation is the most thorough of its kind known to have been made and gives with reasonable accuracy the following differences in the cost of construction:

Cargo Vessel of 10,000 D. W.

British cost .....100 per cent
American cost .....159 per cent

Tank Steamer—9850 Tons D. W.

British cost .....100 per cent
American cost .....160 per cent

Passenger and Cargo Steamer—11,000 Tons Displacement, Loaded

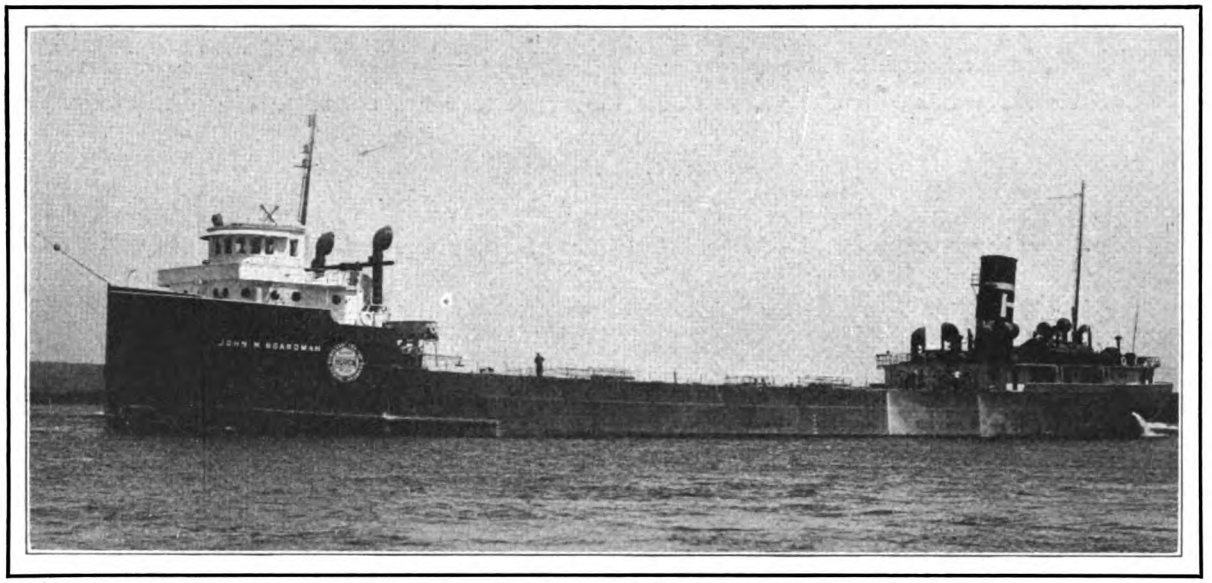
British cost .....100 per cent
American cost .....154 per cent

Interest on investment, insurance and depreciation represent about 27 per cent of the total cost of the operation of a cargo vessel documented under the laws of the United States and the greater cost of a vessel built in the United States therefore imposes upon the operator of such a vessel a continuous handicap of 14 per cent to 16 per cent of the total cost of operation in competition with a foreign built and operated vessel and this handicap exists during the entire life of the vessel. These facts demonstrate the impossibility of building vessels in the United States for the foreign trade without some form of aid to overcome these differentials of cost of construction and operation.

In one of the offices of the United States shipping board in Washington is a chart and tabular statement showing ships of the world in excess of 20,000 gross tons built and in the course of building. This chart discloses 43 vessels of 20,000 tons or more now in operation in the foreign trade, of which only two fly the American flag, the LEVIATHAN and the GEORGE WASHINGTON, each built abroad and a war inheritance. Fourteen additional vessels each of more than 20,000 tons are now being built but not one is an American vessel; therefore of the total of 57 vessels of this larger class only two fly the American flag and both were built in foreign shipyards.

(*Continued on Page* 90)

This is Part II and concludes an address by Mr. H. G. Smith before the National Industrial Conference Board Inc. on Jan. 19 at New York. Published by MARINE REVIEW in two parts. Part I appeared in the March issue.



John W. Boardman—Self-Unloading Cement Carrier—Owned by the Huron Transportation Co., Detroit

Know Your Service Conditions

For Successful Performance of Equipment Satisfactory Results Are Obtained Only by Proper Installation and Operation of All Dependent Units

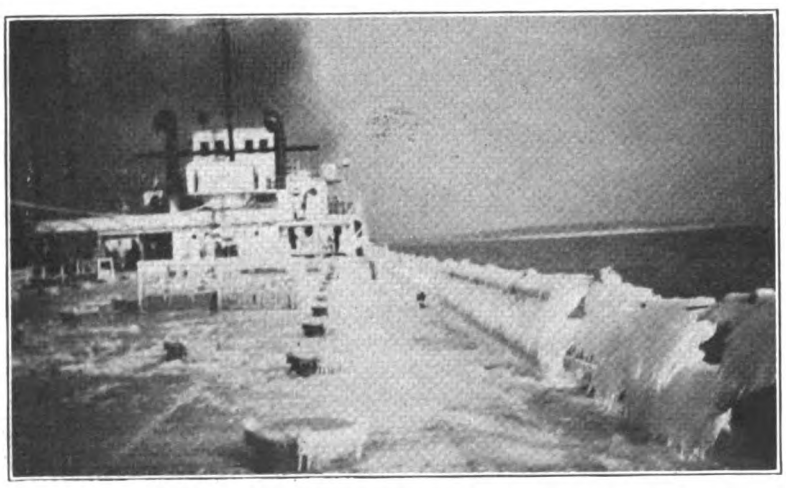
By L. M. Rakestraw

IN THE design of a superheater there are encountered variables which have a marked effect upon the final temperature of the steam. Before completing the final arrangement, the designer must decide for himself what the approximate conditions will be, including the percentage of moisture in the steam, the percentage of CO_2 in the flue gases and the temperature of the exit gases from the boilers. With the experience now available it is possible to determine these conditions very closely. A typical example of what may happen when some of these factors diverge from the designer's original estimates recently developed in the case of the S. S. JOHN W. BOARDMAN of the Huron Transportation Co.

THE BOARDMAN is equipped with two scotch marine boilers, having two furnaces each, tubular air heaters and waste heat Foster superheaters; the latter designed to produce a superheat of 50 degrees under certain operating conditions. Early last spring it was found that the superheat produced was approximately 22 degrees Fahr. and a preliminary inspection showed that although the vessel was fitted with induced draft and air heaters, the boilers were operated with the ashpit doors open. It further developed that the reason for this was that the furnace grates burned out rapidly when operating with the ash pit doors closed. Another interesting condition of operation was that the action of the triple expansion engine indicated the presence of a considerable amount of water in the cylinders in spite of the fact that the steam thermometer showed 22 degrees superheat at the boilers.

Service engineers studying the unsatisfactory performances of the superheaters recognized that the results obtained were allied, in all probability, with other unfavorable conditions. Obviously the preheat of

The author, L. M. Rakestraw, is a member of the staff of the marine department of the Foster Wheeler Corp.



Deck of the Self-Unloader John W. Boardman in Winter

the air was not sufficient to effect the burning of grate bars. Past records were reviewed in order to uncover a similar difficulty. Such an instance was found but the remedy in that case had been the installation of soot blowers under the air heaters. On the BOARDMAN, however, this did not appear to be the trouble as soot blowers were already installed and used regularly.

The conditions were so similar to those of the other vessel, however, that it was felt that the air heater tubes must be at least partially plugged. Arrangements were then made to thoroughly clean the air heater tubes, and to everybody's surprise, a considerable deposit was found in them; in fact, to such an extent as to impede the flow of gas through the air heater. The clearing of the air heater removed the bottling effect on the furnace and the ash pit doors were closed and the vessel run on preheated air without further difficulty. This permitted a free flow of gas through the superheater and resulted in increasing the superheat to approximately 32 degrees.

Efforts were then concentrated on determining the cause of low superheat although furnace conditions were approximately those anticipated by the superheater designer. Investigation of the uptakes indicated that their shape was such as to draw the gas from the inboard side of the air heaters and superheaters to the exclusion of the other portions of the heating surface. Vertical baffles were then installed to control the flow of gases and distribute them over the entire superheater.

Another apparently insignificant matter which had considerable bearing on the results obtained was the fact that the traps for draining the pipe lines connecting the boilers to the superheaters were so placed as to be under a back pressure which prevented their free action.

To confirm the impression that faulty steam trap action was responsible for allowing water to enter the superheaters, an arrangement of ¾-inch, hand-operated valves with drains to the hot well was installed. Opening the valves would release excess water and supplement steam trap action.

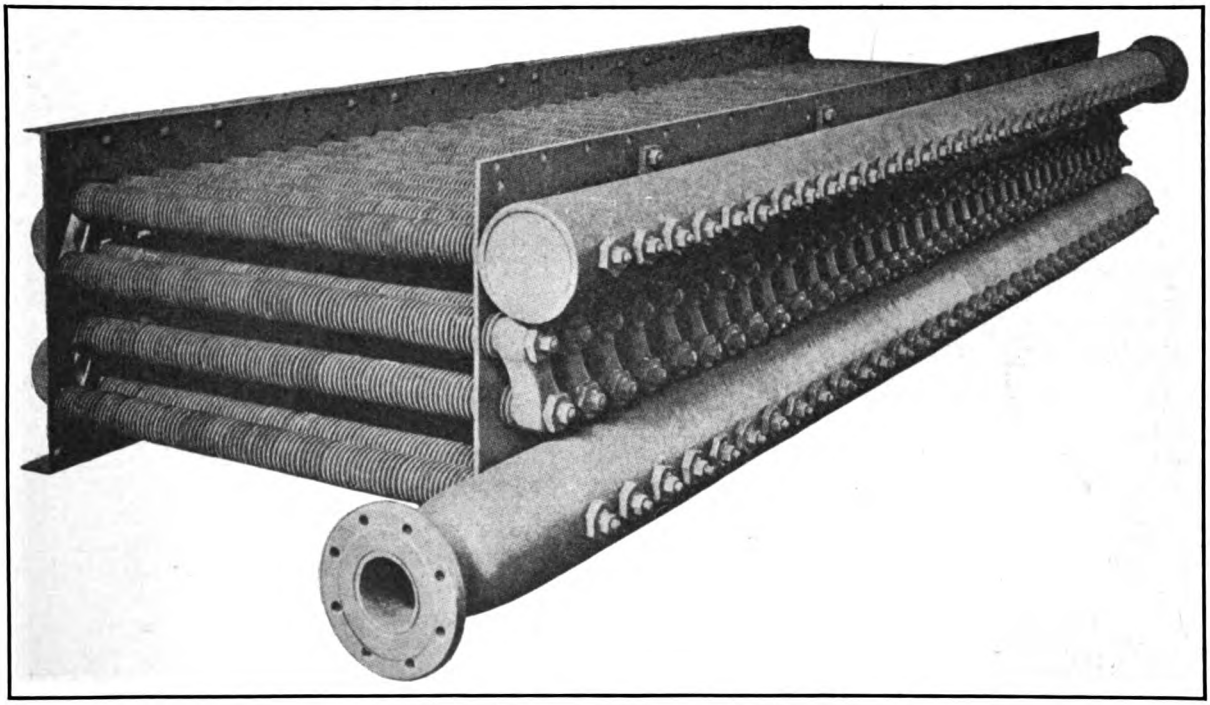
On the next trip of the steamer very satisfactory conditions prevailed and the superheat was in excess of 60 degrees Fahr. It was found that opening or closing the ¾-inch valve in the drain lines had a great effect upon the superheat. A quarter turn of these valves would make a difference of as much as 20 degrees in the superheat; thus showing that steam from the boilers carried a considerable quantity of water.

The performance of the vessel has been greatly improved and an increased speed obtained with the same fuel consumption and without increasing the cut-off of the engine. These improved conditions were not obtained until close to the end of the season when rough weather set in so that a complete comparison in improvement and operation was impossible at that time.

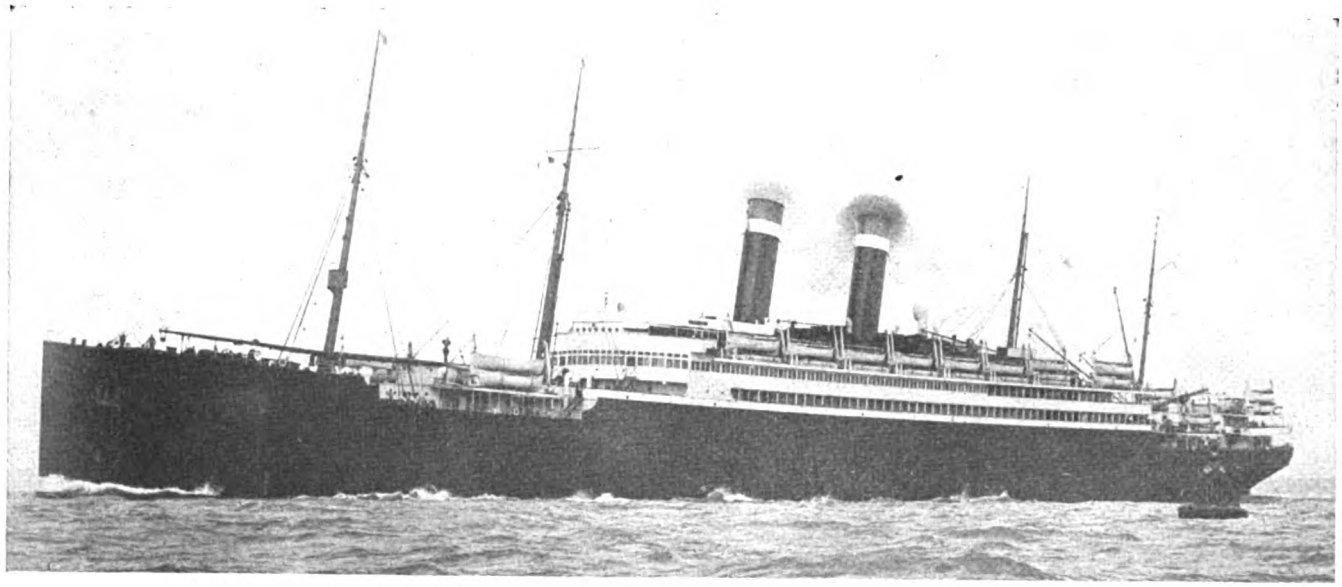
The successful investigation which culminated in the correction of the troubles experienced on the BOARDMAN was made possible by the untiring and whole-hearted co-operation of the chief engineer of the ship and the port officials of the Huron Transportation Co.

Closer Co-operation

In a case such as that recorded here it seems clear that the difficulty with the superheaters was not in any way due to improper design or insufficient capacity but rather clearly to the manner in which inter-related equipment operated. There should be closer co-operation between the shipyard, the equipment manufacturer and the owner's engineer representative. The difficulty was finally discovered, it will be noted, by the equipment maker because it was most vital to him. By the same token greater care might have been exercised by the latter from the beginning to be sure that the assumed conditions prevailed and that his equipment had every chance to operate as intended.



Type of Waste Heat Superheaters Used on the John W. Boardman



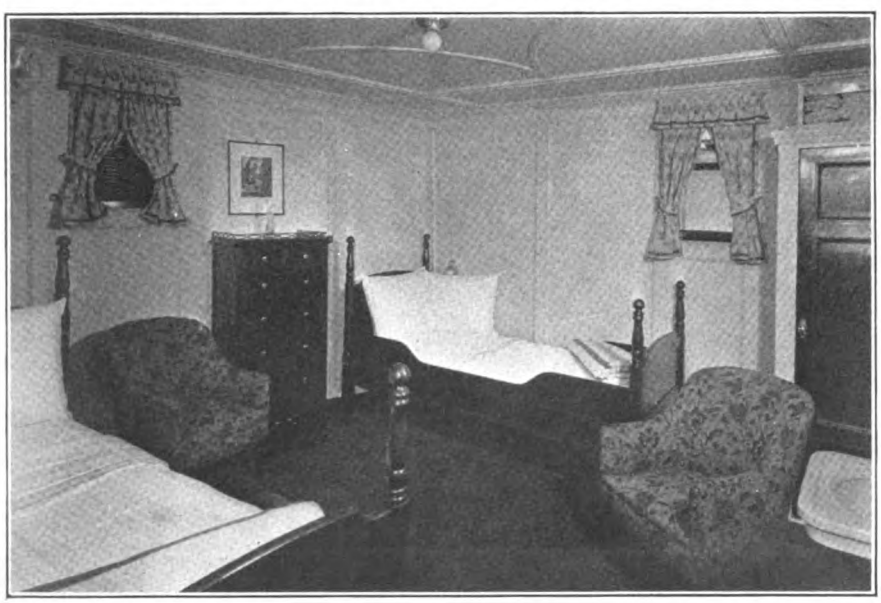
S. S. America of the United States Lines—Rebuilt at Newport News—Now One of the Finest Cabin Ships

America Re-enters Transatlantic Service as Finest Cabin Liner

THE S. S. AMERICA of the United States lines sailed on March 21 for Plymouth, Cherbourg and Bremen on her first voyage after her elaborate reconditioning by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va. She sailed from Pier 4, Hoboken, N. J. with a large passenger list.

With the re-entry of the AMERICA on the transatlantic run the United States lines has one of the finest cabin vessels on the north Atlantic. Of 21,444 gross registered tons and of 687 feet in length she is the third largest ship of the line, being exceeded in size only by the LEVIATHAN and the GEORGE WASHINGTON. Her speed is 16 knots.

This vessel has had a checkered career. She was built by Harland & Wolff for the Hamburg American line and during the war was seized by the United States and served with distinction as a troop transport. After the war she was reconditioned and became popular as a transatlantic liner in the service of the United States lines. In the spring of 1926 a fairly complete reconditioning of the vessel had been completed at Newport News when fire broke out destroying the upper portions though the hull suffered no serious damage. A year passed before any action was taken and then the Newport News Shipbuilding and Dry Dock Co. received a contract to completely convert the vessel as far as quarters and accommodations were concerned into a high class cabin ship. This work was carried out under the immediate supervision of Rear Admiral John G. Tawresey, U.S.N. C.C. retired and Carl E. Petersen, acting for Capt. R. D. Gatewood manager of maintenance and repair for the United States shipping board. All the planning and supervision in connection with this work was carried out directly by the personnel of the shipping board with outside consultation as necessary. The completed job is a credit to those who planned and supervised it and to the Newport News Shipbuilding & Dry Dock Co. who carried out the work.

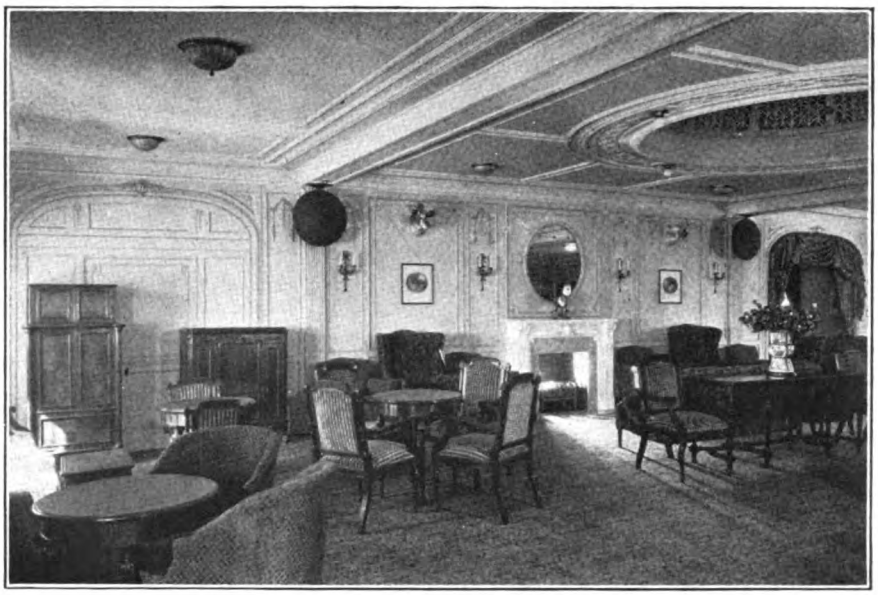


An Attractive Stateroom on S. S. America (Cabin Class) United States Lines

A Large Comfortable Ship

The finished ship was turned over to the United States lines, and the vessel sailed from Newport News for New York on March 3 with Capt. George Fried in command. On this her initial voyage the United States lines had as guests a large representation of passenger agents, other steamship men and technical and op-

erating marine men. After an uneventful voyage in fine weather the AMERICA docked at her Hoboken pier, March 4, at 4 p.m. The unanimous impression prevailed that the AMERICA is now the finest cabin ship afloat. There is a definite feeling of spaciousness both on decks and in the comfortably furnished and attractively decorated public rooms. Even with the critical taste which is growing among the traveling public it would be difficult to see any material advantage in the first class liners over this splendidly appointed roomy and comfortable cabin liner. The United States lines in the AMERICA can offer the traveling public the most distinctive cabin vessel in the Atlantic service. She stands out as the greatest undertaking in cabin ship construction which has ever been accomplished either here or abroad.



Library of the S. S. America—United States Lines

A large group of public rooms has been provided among which are included a social hall, lounge, smoking rooms, dining room and children's playroom.

The social hall is of Louis XVI design. The woodwork is selected chestnut carved and ornamented in gold. The color scheme has been worked out in an harmonious manner. The furniture is luxurious and arranged for comfort and individuality. There is a dancing space in the center of this room. In the lounge the same period has been employed. There are a large number of windows in this room giving light and cheerfulness. The decorative scheme is carmine and green. In the corner of the room there is a library. The smoking rooms are a reproduction of the Jacobean period. The lower smoking room is provided with heavily upholstered arm chairs. In the dining room, decorated in Louis XIV style, there are tables for two, four, six or eight passengers. This room seats 374 people at one time.

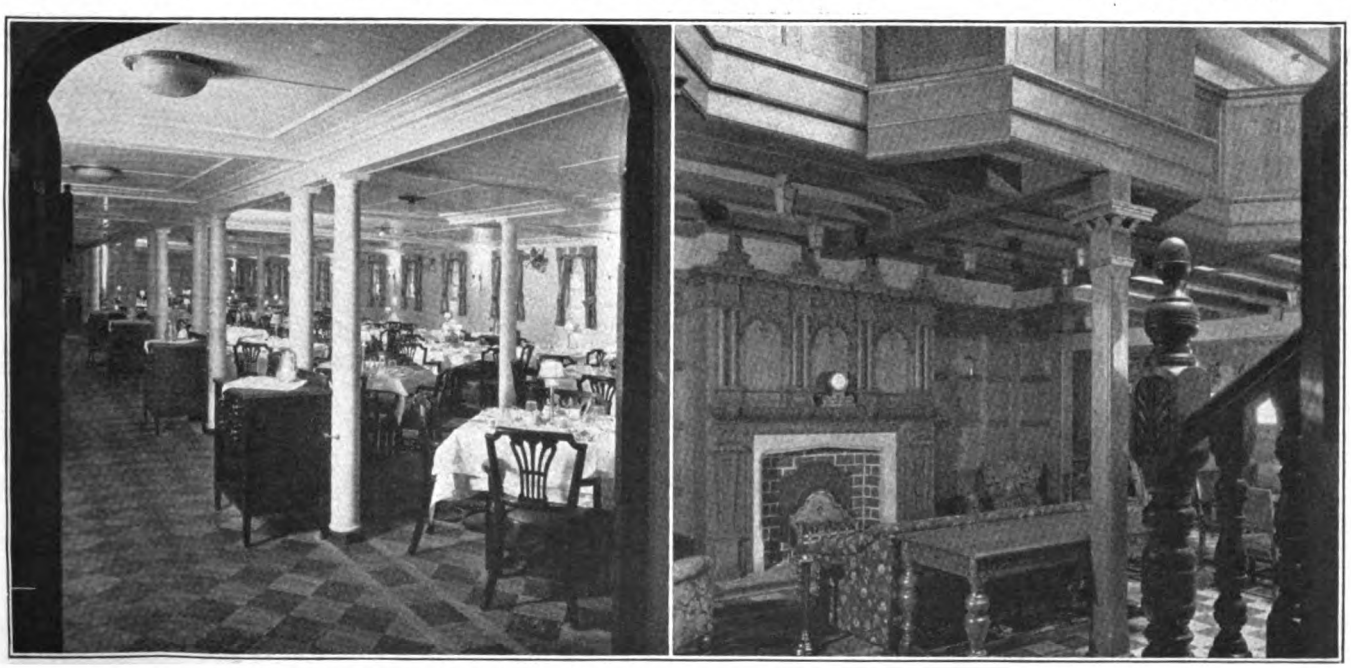
Staterooms are provided with berthing accomodations with the most modern equipment. There are a large number of rooms with bath. Colonial design in general has been followed in the staterooms. Every stateroom above E deck is provided with 36-inch beds, springs of special design and inner spring mattresses.

Fine Tourist Accommodations

Tourists accomodations on the new AMERICA are particularly attractive and should appeal to people of refinement who desire to travel as economically as possible. These accommodations it is believed surpass any similar accommodations for tourists. The public rooms and staterooms have been fitted out with refinement dignity and to give comfort without any show of extravagance. Spacious and attractive public rooms are provided for the use of the tourist class. The solid comfort of public rooms and staterooms for tourists should make the AMERICA a very popular ship with travelers.

All features in connection with safety have been given particular attention. A modern wireless plant has been installed which will provide communication with land at all times. Safety devices of the new AMERICA throughout include the best that can

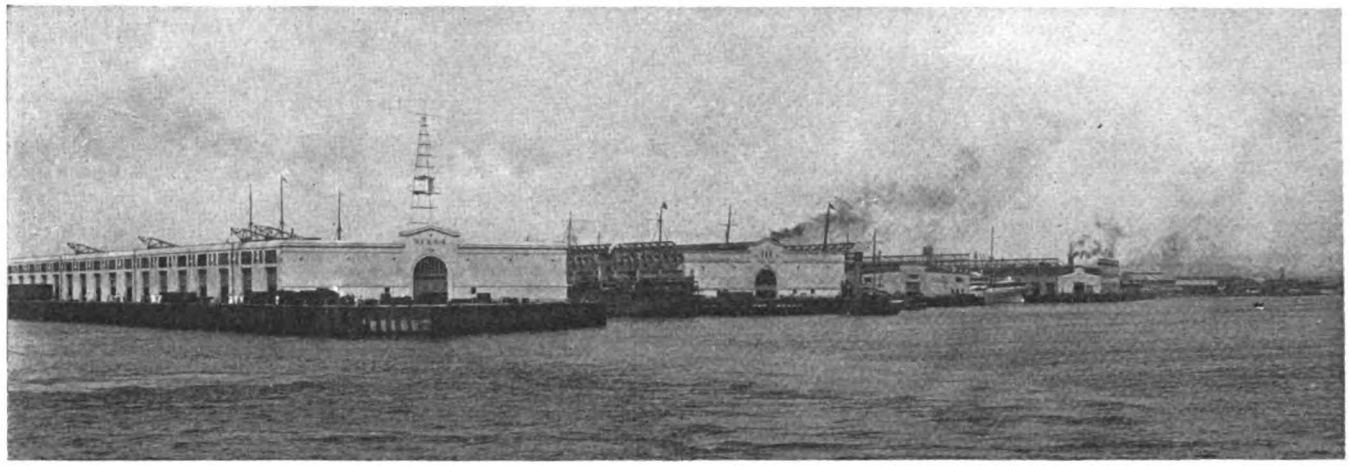
(*Continued on Page* 92)



At Left—Dining Room—At Right—Cabin Smoking Room on the S. S. America—United States Lines

Dock Management Progress Section

How Successful Dock Operators Have Met Problems of Giving Best Service to Ships



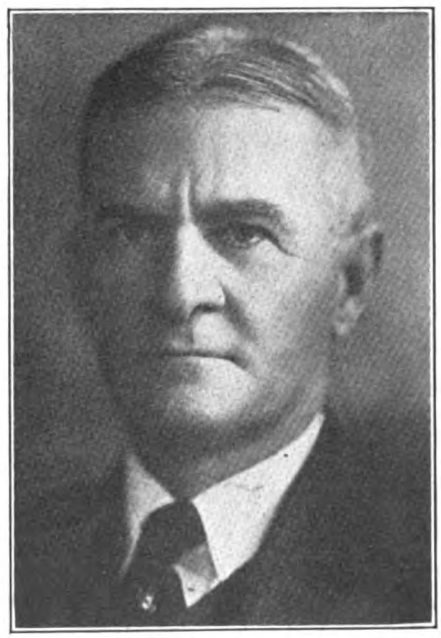
Entrance to Piers at Cristobal, Panama Canal

Panama Canal Traffic Reached A New High Record During 1927

By Seymour Paul

THE past year has seen the Panama canal at what may be termed a peak of operations, unless it should develop that this has been only the upward slant of the curve of traffic and that the peak is yet to be reached. Several times during the last year new records for a month's traffic were established. A total of 6085 commercial ships transiting the canal in the calendar year 1927 set a new high figure for a year's traffic. Tolls for the year, also a new record, amounted to $26,231,022.94. The amount of cargo handled reached a new high figure of 29,102,538 tons. Traffic in January, 1928, while less than that of the record month of December, 1927, was at a rate higher than the daily average of the year 1927. Traffic for the first 15 days of February set a new high record for daily average.

The volume of shipping passing through the canal now is about one-fifth to one-fourth more than it was a year ago. Growth has occurred in all major trades except that with Australia and New Zealand. With the exception of the addition of half a dozen new pilots and a few more operators of towing locomotives at the locks, the canal administration has not had to increase the force in order to handle the greater traffic.



BRIG. GEN. M. L. WALKER, U. S. A.
Governor of the Panama Canal

It has, however, increased the length of the operating day slightly. Prior to Dec. 15, 1927, the operating practice was to start ships through the canal from each terminal at approximately 6:30 in the morning and to continue to dispatch vessels at half-hourly intervals up to early afternoon; the last ship from the Atlantic to reach Gatun locks not later than 2:20 p.m. and the last from the Pacific to reach Miraflores locks by 3:30 p.m. The ruling principle was that ships should not be started through the canal so late as to make it impossible for them to complete passage through Gaillard cut before dark. Beginning Dec. 15, 1927, this practice was modified by adopting a plan whereby ships which cannot be scheduled for complete transit through the canal on the day of arrival may be passed through the locks up to the summit level of Gatun lake in the afternoon after the scheduled hours for complete transit. Ships so raised to the summit level in the late afternoon or evening are moored at Gatun or Pedro Miguel for the night and leave at daylight the following morning to complete transit. This

system saves about 4 hours as an average for ships which arrive too late for complete transit.

Profit of $10,000,000 a Year

Like other well conducted enterprises doing a big business, the canal has made a distinct profit in the past few years.

The investment in the canal and its adjuncts is partly for national defense and partly commercial. Investment charged arbitrarily to national defense at the beginning of the fiscal year 1927 (stated in round figures) was $113,000,000 and that to commercial use $275,000,000. The latter figure may be considered the capital invested in the canal in a commercial sense. Annual interest at 3 per cent (which is the rate on most of the bonds issued to cover canal construction) would be $8,250,000. The following figures of canal expenses do not include this interest charge but do include a fixed annual charge of $350,000 for amortization of canal fixed property having a life of 100 years and $625,000 covering depreciation at two per cent per annum on property having a life of less than 100 years, which together with interest at 3 per cent per year will provide for amortization of the investment or replacement of all items at the end of 100 years. In addition, the expenses include a further charge of approximately $600,000 per year for depreciation of canal equipment.

Revenues and Expenses Panama Canal-1927

Canal Transit Revenues:	
Tolls	$26,219,535.23
Taxes, licenses, fees, and fines	72,121.03
Postal receipts	145,830.83
Interest on bank balance	10,000.00
Sales of government property	167,970.28
Miscellaneous	196.17
Total canal transit revenues	*$26,615,643.54
Canal transit expenses	$11,152,999.99
Depreciation — amortization fixed property	980,335.78
Gross canal transit expenses	$12,133,335.77
Canal transit earnings	**3,257,497.58
Net canal transit expenses	$ 8,875,838.19
Canal transit revenues	$26,615,653.54
Net canal transit expenses	8,875,838.19
Net canal transit revenues	$17,739,815.35
Fixed capital charge	$ 7,318,024.34
Surplus	$10,421,791.01
Canal business revenues	$16,453,411.80
Canal business expenses	15,645,666.44
Net business revenues	$ 807,745.36
Fixed capital charge	765,971.13
Surplus	$ 41,774.23
Panama canal revenues ($26,615,653.54 + 16,453,411.80)	$43,069,065.34
Panama canal expenses ($8,875,838.19 + 15,645,666.44)	***24,521,504.63
Net revenues	$18,547,560.71
Fixed capital charge	8,083,995.47
Surplus	$10,463,565.24

*Covered into United States treasury as miscellaneous receipts.

**Repaid to canal appropriations.

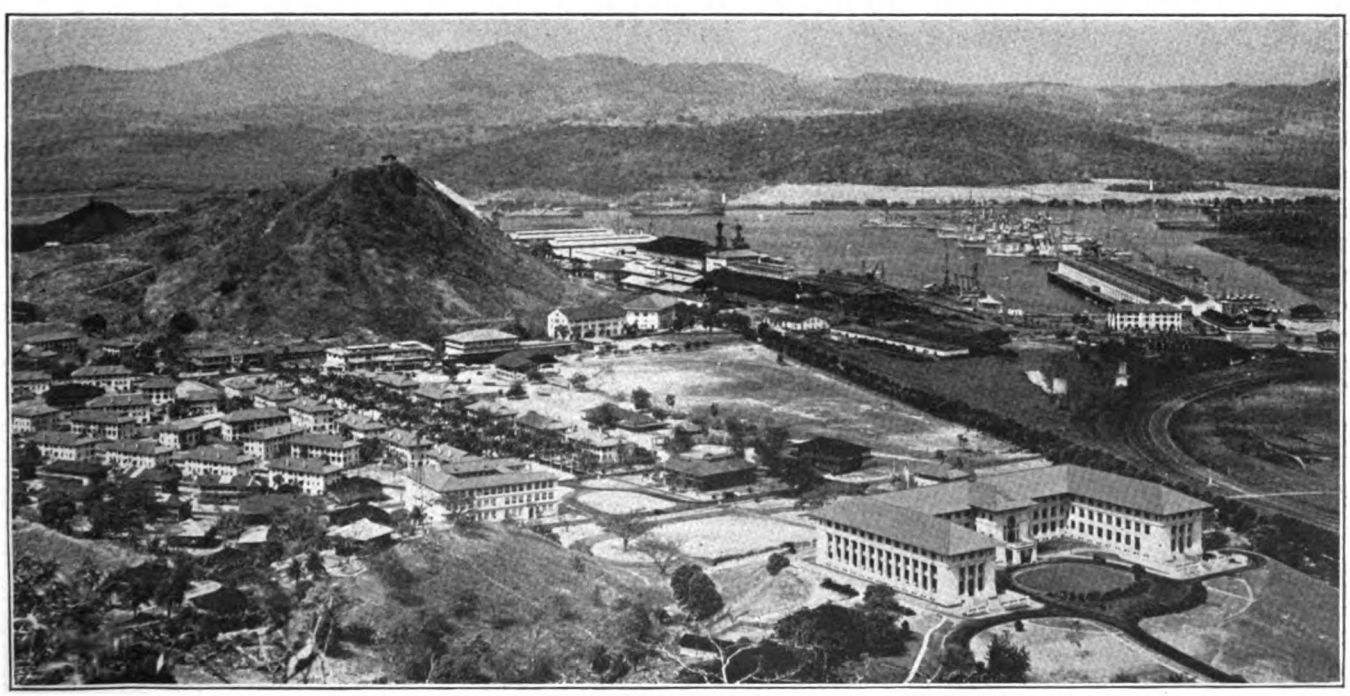
***The amount of salaries and wages included in this figure is $11,681,220; the balance of $12,840,284.63 is other expenses.

Revenues were less than the actual expenses of operation during the first four years after the opening of the canal, Aug. 15, 1914. This was due largely to slides in Gaillard cut. In the later years revenues have exceeded the cost of operation and maintenance. To June 30, 1927, the operating expenses for the canal proper amounted to approximately $95,000,000, and the revenues to over $168,500,000, of which $166,075,423.60 was for tolls alone. In addition, the operating expenses of certain auxiliary business units amounted to over $143,000,000 more, against business revenues of over $149,000,000. The excess of total earnings over total expenses at the beginning of the present fiscal year, July 1, 1927, stood at $79,953,875.53. However, as stated above, this figure does not include the $8,250,000 annual interest on the commercial investment, which must be taken into consideration in comparing the canal with a commercial enterprise. For the 13-year period at simple interest this charge would amount to $107,250,000, and applying the $80,000,000 operating surplus against this charge would still leave a deficit of over $27,000,000. At compound interest the deficit would be considerably more.

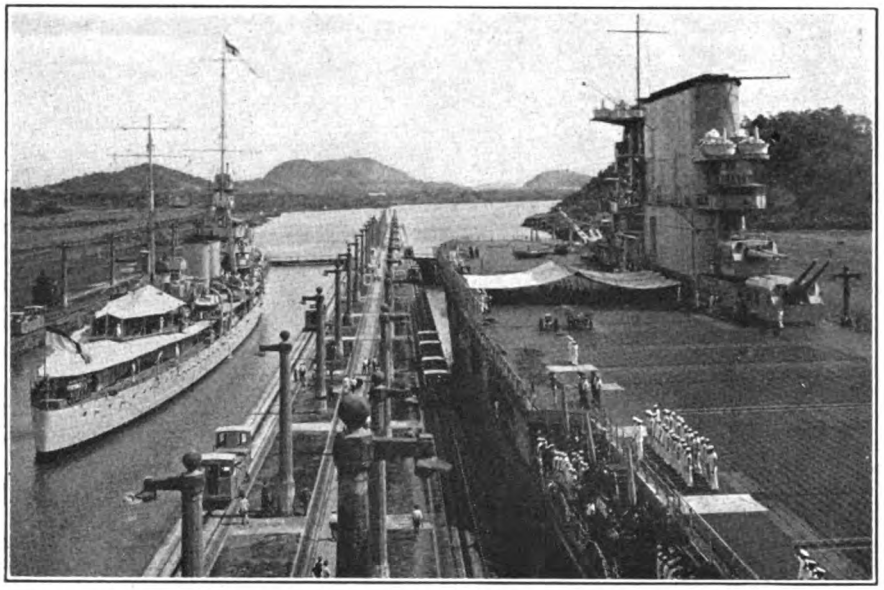
Earnings Show Large Increase

However, the total earnings of the Panama canal during the fiscal year closed June 30, 1927, were $40,487,463.39, of which tolls amounted to $24,217,185.32. The corresponding expense of operation and maintenance, including depreciation, but exclusive of interest on the commercial capitalization, was $23,999,832.79, leaving net revenues $16,487,630.60, which is about twice the annual interest figure and leaves a surplus of approximately

The author, Seymour Paul, is chief of the bureau of statistics of the Panama canal. The photographs used for illustrations were made by E. Hallen, official photographer of the Canal. This article was prepared for MARINE REVIEW at the request of the editor.



Administration Building of the Panama Canal, the Town of Balboa, Balboa Shops and the Inner Harbor



U. S. S. Saratoga and H. M. S. Despatch in Miraflores Locks, Panama Canal Feb. 7, 1928—The Saratoga, 888 Feet Long,—107.9 Foot Beam, Largest Vessel to Go Through

$8,250,000 to be applied to wipe out the deficit of previous years.

The greatest amount of tolls earned in any one month has been $2,398,459.75, in December, 1927. For the calendar year 1927 the surplus or profit was $10,463,565.24. A general statement of results for the year is shown in tabulated form on page 79.

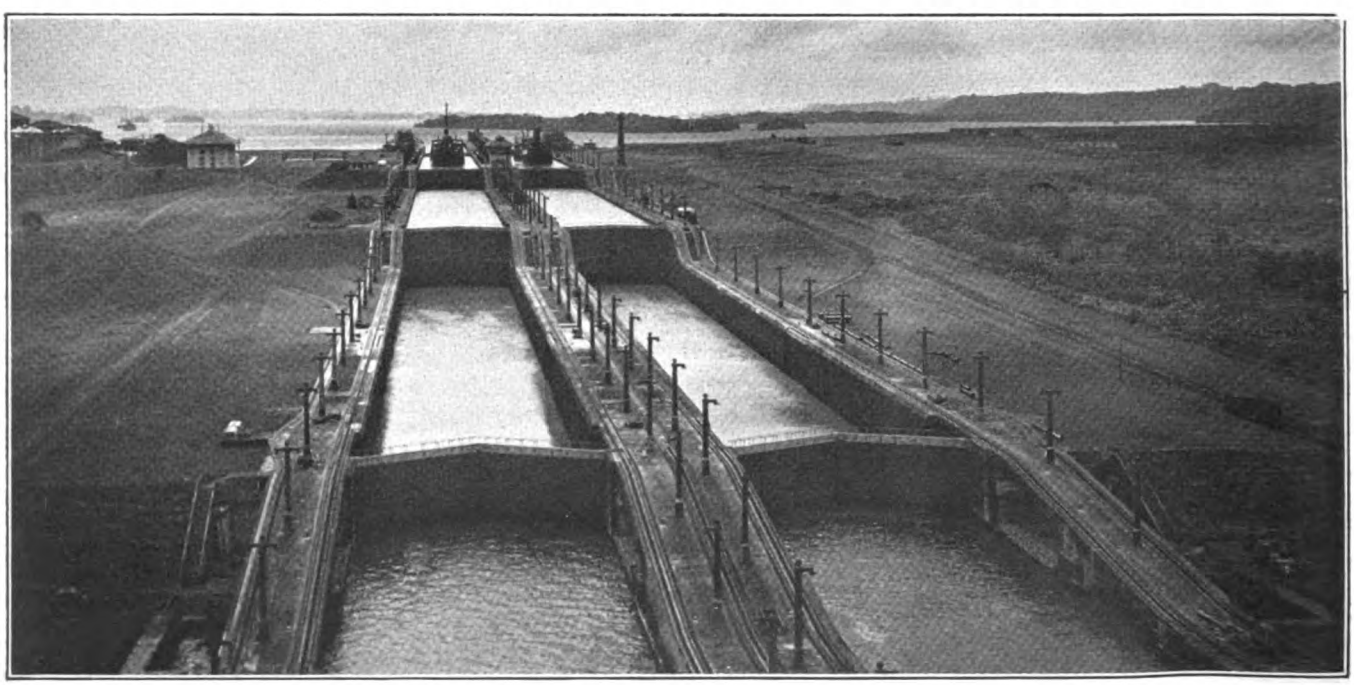
Future Expansion is Anticipated

American business vision looks to the future. Obviously the canal is busy and prosperous at present. What of the future? The canal is operating now at about 40 per cent of its year around capacity. In the present form of the canal the capacity is not the same throughout the year because every year toward the end of the dry season there is a threatened shortage of water. If this shortage were to go to extremes it might so reduce the depth of the canal in the lake and Gaillard cut sections and over the sills of the emergency dams and for the upper gates of the locks at Gatun and Pedro Miguel as to make difficult or dangerous the passage of deep draft vessels.

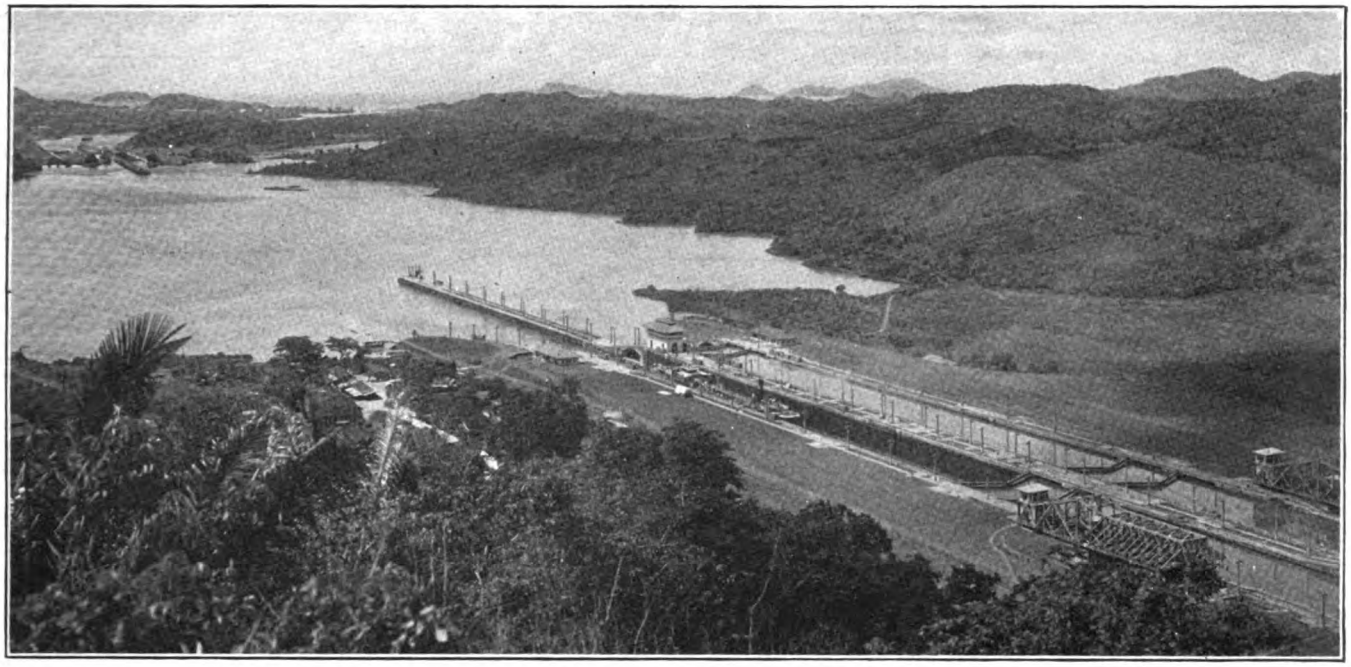
The normal elevation of the Gatun lake surface is about 85 feet above sea level. The bottom of Gaillard cut is 40 feet above sea level. The sills of the upper gates of Gatun and Pedro Miguel locks are 37.33 feet above sea level. Near the beginning of the dry season in the latter part of December it is customary to allow the surface of the lake to rise to slightly over 87 feet above the sea. This provides a storage of water for consumption during the dry season when the runoff from the watershed is less than the loss of water. It is estimated that the canal could be operated with the lake at elevation plus 80 feet, or 7 feet below the maximum level. During the years of operation the lowest stage yet reached by Gatun lake has been 81.39 feet. With the increase in traffic, it is possible that with a prolonged or extremely dry season the surface of the lake might fall to or below the line of 80 feet. To obviate this danger the canal administration proposes to construct a supplementary reservoir on the upper reaches of the Chagres river, above the edge of the present Gatun lake. The reservoir is to be constructd by building a concrete dam about 170 feet high, with its top at approximately 260 feet above sea level, across the river between rock cliffs at Alhajuela. This will add about 23 billion cubic feet of storage to the present storage of 32 billion cubic feet which exists in Gatun lake between elevations 87 and 80 feet. It will eliminate for many years the concern for an adequate water supply.

Next Step Additional Locks

After this improvement the traffic through the canal could be double its present rate without endangering the ability of the waterway to handle it without delay. In case the traffic should continue to grow, the next step for enlarging the capacity would be the construction of a third set of locks. The present locks are twin



Gatun Locks from Atlantic End. Gatun Lake in Background. Gatun Dam at Upper Right



Pedro Miguel Locks, Miraflores Lake and Miraflores Locks—Pacific Sea Level Section of Panama Canal in Background

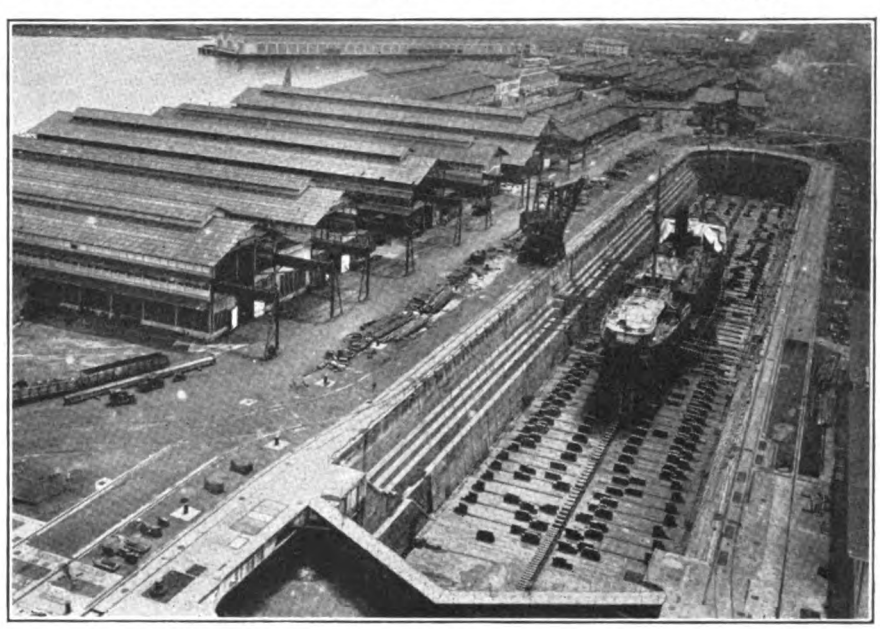
or double-barreled, and the construction of a third flight would give an increase of 50 per cent in the capacity for lockages. The need of this third flight is apparently remote, as we are yet a long way from reaching the full capacity of the present canal. With the third flight of locks it would be possible to handle about four times as much traffic as is now making use of the canal.

Constantly Improving the Channel

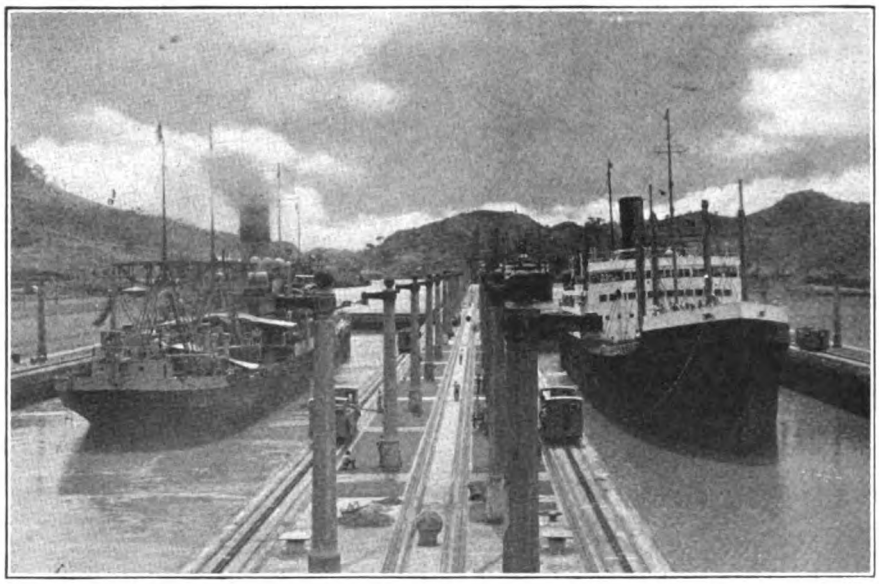
The Alhajuela project has not yet been begun, but surveys have been made and the necessary land has been acquired. The house of representatives has passed an appropriation of $250,000, which is not yet through the senate, for preliminary work. This may be used either for road work in the construction of a 16-mile road necessary to connect the present Canal Zone roads with the site of the dam, or may be used in preliminaries on the site, such as drilling in order to determine the best location and most suitable type of dam. It is estimated that the entire project would cost about 10 million dollars and require about five years for completion. On account of the time involved the canal administration has been urging for several years past the immediate beginning of the work.

The Alhajuela project is the major improvement in prospect for the canal. For several years past, however, the present channel has been undergoing improvement. This embraces two main features. One is deepening the Pacific sea level section; the other is the widening of Gaillard cut at certain curves and approaches in order to make navigation easier and safer.

The cut, as constructed, followed roughly the courses of the Obispo and Rio Grande rivers, and for the sake of economy did not adopt the straight line which is the shortest course between two points. It has been necessary to operate a dredging fleet to maintain the channel against slides and silting, and this fleet has been employed also in widening and deepening the channel where advisable. In the Pacific sea level section, a distance of about eight miles, from the lower end of Miraflores locks to deep water in the Pacific, the depth of the 500-foot wide channel as originally completed was 45 feet at mean tide. The tidal range at Balboa is as much as 21 feet. An extreme tide reduces the depth of the channel in the Pacific sea level section to less than 35 feet. The canal has handled vessels drawing over 36 feet of water. To provide ample depth for such vessels and for capital ships of the navy at any stage of the tide, the administration is deepening the entire Pacific sea level section by five feet to a ruling depth of 50 feet below mean sea level. This project, which is being worked on steadily by a few of the elements of the regular dredging fleet, has been under way for about three and one-half years and probably an equal length of time will yet be required to complete it in a satisfactory manner.



Pacific Terminals Dry Dock and Shop Buildings, Balboa, Canal Zone



S. S. Duchesa Aosta and President Polk in Pedro Miguel Lock, July 16, 1927

There appears to be no occasion for alarm as to the adequacy of the canal unless the development of the Alhajuela reservoir should be delayed. The canal administration gives constant thought to maintaining a canal ready for all present and future demands. If the government officials responsible for the canal should prove thoughtless or lax, the steamship operators may be relied upon to complain promptly of a shortage of facilities. At present they are not complaining.

Foreign Trade Meeting

The National Foreign Trade council will hold its fifteenth annual convention at Houston, Texas on April 25, 26, 27.

One of the principal themes of the convention will be United States trade with Latin America and business delegations from more than ten Latin American countries will attend. There will be present delegates consisting of American business executives from more than thirty states. Conferences will be held on the sales and distribution practices most successful south of the Rio Grande and on import credit banking and advertising.

Norman F. Titus, chief transportation division, bureau of foreign and domestic commerce will speak on the fundamentals of an American merchant marine. Such a meeting dealing with the entire subject of foreign trade is closely identified with the question of how an American merchant marine can be developed. Before such a marine can be developed it is clear that it will be necessary to have the good will and co-operation of those who are engaged in foreign trade. James A. Farrell, president of the United States Steel Corp. is chairman of the National Foreign Trade council. He is expected to preside over the activities of the convention. Headquarters of the National Foreign Trade council is located at India House, Hanover Square, New York and O. K. Davis, secretary will be glad to furnish full particulars in regard to the convention.

Cunard Line Record

It is quite a record to have led all other lines each year for fifty years in the total number of passengers carried across the Atlantic. According to a statement issued by Harold P. Borer, general passenger manager, that is the record the Cunard line holds. During 1927, 269,167 passengers were carried. An increase was shown in all classes of travel but was particularly noticeable for tourists third cabin. During this year the Cunard line hopes to continue its good record as it will have the practically rebuilt CARONIA and CARMANIA and the SCYTHIA and LACONIA have been added to the list of cabin steamers. In all the company has twenty-four oil burning vessels of 475,000 gross tons in the North Atlantic service.

Positions Are Open

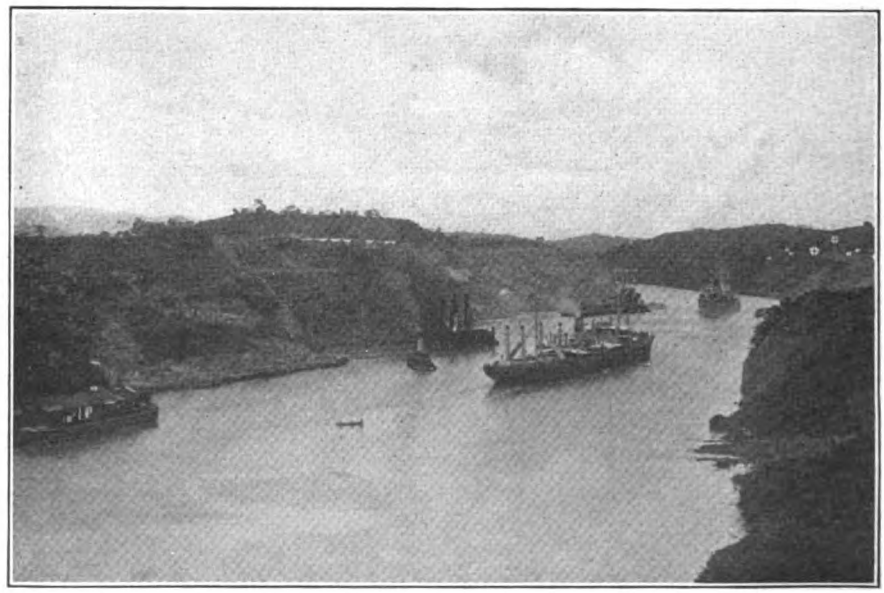
By addressing the United States civil service commission, Washington, or by going to the post office or Federal building information may be obtained concerning positions in the steamboat inspection service as local and assistant inspectors of boilers. The entrance salary is $2700 a year. Any competent sea-going engineer who is a citizen of the United States is eligible.

It is reported that a deed has been executed giving title to the Cape Cod and New York canal to the United States government. Approval was voted by stockholders March 15.

Marine Statistics for Jacksonville

(Exclusive of Domestic)

	—Entrances—		—Clearances—	
Month	No. ships	Net tonnage	No. ships	Net tonnage
February, 1928	31	70,881	28	58,896
January	26	71,686	27	71,721
December	25	59,744	27	72,636
November	33	72,807	30	74,376
October	26	66,539	24	62,881
September	21	56,916	24	58,165
August	30	77,997	31	86,771
July	26	69,813	27	63,595
June	32	79,910	26	65,919
May	31	73,616	32	70,715
April, 1927	23	51,137	21	54,964



Grading, Drilling and Dredging at Lirio Point, Gaillard Cut—Cutting Back Point to Facilitate Navigation Around the Curve

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	513	2,205,204	501	2,135,910
January	540	2,160,576	512	2,146,026
December	436	1,770,154	548	2,222,409
November	543	2,243,752	474	2,069,106
October	485	2,105,364	531	2,221,372
September	**498**	**2,153,701**	**565**	**2,428,200**
August	522	2,179,068	551	2,287,867
July	478	1,910,229	553	2,253,495
June	498	2,093,540	566	2,334,128
May, 1927	525	2,167,154	539	2,179,208

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	88	239,768	53	152,545
January	81	206,710	54	141,408
December	81	206,171	42	108,935
November	78	193,676	43	99,965
October	94	211,988	63	136,871
September	**77**	**183,481**	**50**	**95,898**
August	**99**	**235,657**	**70**	**153,305**
July	83	186,182	53	110,614
June	**95**	**218,122**	**66**	**180,861**
May, 1927	88	196,606	47	86,214

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	100	301,053	50	160,330
January	102	328,779	61	197,133
December	91	255,980	52	169,150
November	98	320,340	63	178,707
October	107	380,655	69	244,265
September	114	375,509	83	243,244
August	**149**	**441,819**	**96**	**285,255**
July	**147**	**401,008**	**103**	**326,695**
June	**155**	**344,548**	**99**	**242,957**
May, 1927	130	318,196	100	262,982

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	18	44,067	17	47,032
January	21	57,757	18	48,294
December	23	50,380	23	55,280
November	25	42,291	26	40,248
October	32	60,920	35	71,587
September	**32**	**68,688**	**32**	**61,227**
August	**33**	**61,873**	**32**	**58,949**
July	**37**	**62,890**	**35**	**55,144**
June, 1927	24	31,714	25	34,855

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	3	6,656	4	17,543
January	4	20,931	4	18,817
December	4	11,618	5	21,125
November	4	16,374	2	9,920
October	7	24,736	1	2,875
September	**4**	**12,240**	**4**	**14,109**
August	**5**	**27,235**	**1**	**4,035**
July	**11**	**37,384**	**5**	**17,628**
June	**8**	**12,559**	**5**	**15,930**
May, 1927	9	36,882	6	25,950

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	23	86,160	35	120,026
January	37	130,578	50	183,254
December	34	134,562	61	228,472
November	38	141,747	70	247,571
October	57	208,738	70	254,270
September	**59**	**211,182**	**79**	**291,920**
August	**32**	**117,116**	**47**	**157,715**
July	**31**	**110,966**	**35**	**119,824**
June,	**24**	**91,554**	**33**	**118,631**
May, 1927	24	86,618	28	98,277

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	134	412,110	135	399,729
January	116	354,307	120	374,617
December	129	406,889	132	398,587
November	103	330,488	110	323,666
October	118	365,876	116	350,509
September	**116**	**355,924**	**130**	**402,528**
August	131	390,718	138	408,083
July	128	384,450	130	368,096
June,	125	375,204	125	376,019
May, 1927	112	333,395	117	340,274

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	13	32,925	77	206,630
January	14	29,831	75	202,997
December	17	35,439	78	207,636
November	23	51,726	78	206,978
October	25	65,640	77	214,940
September	**26**	**67,249**	**87**	**240,899**
August	32	71,356	92	222,502
July	42	112,442	77	201,882
June	34	61,041	82	190,228
May, 1927	27	56,458	70	179,658

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1928	30	93,778	36	114,845
November	30	98,308	35	99,833
October	41	119,953	39	112,138
September	36	108,866	40	118,431
August	30	90,063	30	93,030
July	33	96,525	30	87,055
June	27	67,095	30	75,193
May	**37**	**103,549**	**37**	**102,757**
April	**30**	**87,296**	**26**	**108,150**
March, 1927	37	102,732	39	114,871

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	121	91,928	109	88,819
January	110	85,955	123	85,750
December	103	91,299	101	90,557
November	112	92,152	107	89,156
October	80	87,814	83	88,587
September	**69**	**86,793**	**72**	**88,480**
August	72	81,247	70	84,132
July	78	84,790	79	84,186
June	84	97,585	85	97,535
May, 1927	105	113,030	106	115,564

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	94	271,569	83	226,210
January	117	309,644	82	216,381
December	75	189,231	73	178,068
November	75	161,528	79	176,885
October	89	210,973	97	237,282
September	**80**	**172,518**	**89**	**195,714**
August	92	194,609	84	184,655
July	94	198,668	89	190,965
June,	97	206,410	84	165,649
May, 1927	114	237,650	103	205,876

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	54	210,176	53	207,173
January	50	206,743	62	239,133
December	56	232,726	58	241,398
November	59	231,003	68	264,841
October	68	268,666	69	272,875
September	62	233,554	58	227,096
August	109	218,218	102	203,902
July	45	183,023	40	162,121
June	38	159,687	39	162,632
May, 1927	41	177,869	42	169,083

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	238	627,445	236	616,772
January	271	725,935	272	697,301
December	240	671,775	258	714,455
November	226	586,018	236	609,299
October	260	693,720	265	710,922
September	232	613,772	240	632,593
August	276	797,128	265	672,392
July	250	615,826	241	580,228
June	248	606,501	267	750,937
May, 1927	277	640,252	269	627,452

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net. tonnage	—Clearances— No. ships	Net tonnage
February, 1928	26	74,244	27	73,168
January	32	83,419	52	150,260
December	27	65,379	25	63,354
November	32	77,911	33	81,978
October	37	95,473	36	95,070
September	39	102,374	39	101,044
August	39	108,022	35	92,227
July	19	41,460	20	44,633
June	25	67,366	24	62,132
May, 1927	26	79,355	24	63,862

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	27	63,696	52	147,378
January	32	83,419	52	150,260
December	34	79,353	51	142,779
November	43	103,885	66	179,841
October	69	184,154	99	290,370
September	**70**	**200,573**	**97**	**301,105**
August	**76**	**214,876**	**95**	**274,670**
July	**77**	**204,961**	**93**	**260,481**
June	**67**	**173,331**	**75**	**199,410**
May, 1927	80	218,443	101	281,221

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1928	167	477,974	165	437,080
December	...	...	...	...
November	248	507,775	185	429,101
October	266	573,090	202	489,442
September	**238**	**488,416**	**282**	**441,134**
August	**160**	**483,069**	**214**	**473,702**
July	121	452,983	106	407,695
June	178	484,561	125	418,967
May	**161**	**470,471**	**138**	**456,885**
April	**179**	**477,762**	**173**	**441,374**
March, 1927	156	451,428	165	442,022

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1928	158	501,080	165	640,220
January	145	602,389	154	607,904
December	171	665,944	158	631,872
November	139	538,160	135	578,466
October	173	630,193	162	507,386
September	**168**	**600,454**	**152**	**559,684**
August	176	636,152	150	583,653
June	154	556,225	140	526,976
May	**148**	**545,414**	**137**	**510,560**
April, 1927	141	531,380	137	518,577

Port Arthur

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1928	20	69,947	20	72,185
December	23	67,105	21	68,602
November	21	64,277	25	80,084
October	18	50,632	25	82,177
September	16	51,492	29	83,728
August	22	58,352	27	78,652
July	21	61,871	34	102,998
June	16	44,565	26	92,198
May	**15**	**46,223**	**28**	**83,926**
April	**26**	**57,645**	**40**	**107,757**
March, 1927	20	47,739	23	58,802

Note: The figures given in this table are for direct entrances and clearances. Additional vessels in foreign trade enter and clear from and to other American ports after original entry and before final departure. At the port of Philadelphia, for instance, additional vessels in the foreign trade in this category were 63 of 210,626 net tons entered and 87 of 274,363 net tons cleared for the month of February.

Up and Down the Great Lakes

Coast Guard Cutter Needed—Geared Turbines Proposed in Lake Vessels—Launch Ferry — Buffalo Terminal — Prominent Lake Operator Dies—Chicago Trade

A FIRST class cutter such as used by the coast guard on the Atlantic to aid distressed vessels, will be assigned to the Great Lakes division with headquarters in Sault Ste. Marie, if a bill introduced by Congressman T. E. Burton is approved at Washington.

Since the old tug MACKINAC was taken away, no suitable cutter has been available to the coast guard here to aid shipping during rough weather. Consequently in many cases where the coast guard could have helped with a first class cutter, they were forced to stand by or risk their lives in inferior craft as was the case last fall at Keweenaw.

Five wrecks might have been reached by the coast guard last fall in an ocean going tug stationed at Sault Ste. Marie. The coast guard did what was possible but was badly handicapped by the lack of any proper vessel to put in the lake under the weather conditions prevailing.

The Great Lakes with a water area of 95,000 square miles and a United States coast line of 4345 miles in length, having 850 commercial vessels valued at $250,000,000 and carrying 135,000,000 tons of freight annually, are entirely devoid of a suitable craft in charge of the coast guard to assist vessels in distress and to perform the manifold duties devolving on that organization.

Reprinted from *The Evening News*, Sault Ste. Marie, Mich., for March 14, 1928.

Turbine Drive Proposed

In order to inform Great Lakes operators and engineers about the turbine geared drive, two Westinghouse engineers, Ira Short, head of marine engineering, and Albert O. Loomis, marine electrical engineer came to Cleveland, where on March 19 they gave a talk under the auspices of the Cleveland section of the American Society of Mechanical Engineers on geared turbine drive for lake vessels. The meeting was well attended. Mr. Short described the geared drive and gave some figures on relative costs. He pointed out that the geared turbine drive would cost approximately $64,000 more than the usual reciprocating engine but that it would give a saving in operation of approximately $30,000 a year thus completely offsetting the increased initial expense in a little over two years.

A lively discussion followed, the gist of which was that conditions on the Great Lakes are different than on salt water and that therefore, the turbine geared drive proposal cannot be looked upon with favor. It was pointed out that navigation on the lakes is in shallow water and often through restricted rivers and channels, that the lake vessels are rather under powered as it is, and that it is absolutely essential to have maximum backing power and maneuverability. This entire subject should be thoroughly studied from a practical and a theoretical way to remove all questions of misinformation.

February Lake Levels

The United States lake survey reports the monthly mean stages of the Great Lakes for the month of February as follows:

Lakes	Feet above mean sea level
Superior	601.88
Michigan-Huron	578.78
St. Clair	573.55
Erie	571.73
Ontario	245.99

Lake Superior was 0.30 foot lower than in January and it was 0.55 foot higher than the February stage of a year ago. Lakes Michigan-Huron were 0.06 foot higher than in January and they were 0.52 foot higher than the February stage of a year ago. Lake Erie was 0.06 foot higher than in January and it was 0.74 foot higher than the February stage of a year ago, 0.61 foot above the average stage of February of the last ten years. Lake Ontario was 0.05 foot lower than in January and it was 0.68 foot higher than the February stage of a year ago, and 0.97 feet above the average stage of February of the last ten years.

Harbor Expert Retained

R. S. MacElwee commissioner of the Port of Charleston, S. C., authority on harbor development it is reported has been retained as port consultant in connection with the proposed lake front development at Cleveland. All of the city's plans and data in connection with the improvement of the lake front are being forwarded to Doctor MacElwee for his study and criticism.

Build Canadian Ships

If a reasonable proportion of all the steamers building in England for the Canadian lakes and river fleet could have been built in available Canadian shipyards it would have helped greatly to give that industry in Canada real encouragement. Unfortunately only one thing is looked at and that is the question of cost and on this basis the Canadian yards cannot compete.

The Canada Steamship lines is adding a self-unloading collier to its fleet due on this side in June. The Paterson Steamships Ltd. is having seven new vessels built. There are five under way for the Hall Corp. of Canada, three for Water Transports Ltd. and two for another company.

Build New Drydock

A new dry dock is to be constructed at Port Weller and it is expected will be completed in 1930 ready for the opening of navigation in the spring of 1931. Alexander J. Grant in charge of the Welland ship canal is also the engineer for the dry dock which will be large enough to accommodate the longest vessels on the Great Lakes today which is nearly 640 feet in length over all. It is said that 3000 men will be employed on this work.

Launch Windsor Ferry

The new ferry CADILLAC building for the Detroit and Windsor Ferry Co. was launched March 10 at the yard of the builder the Great Lakes Engineering Works, River Rouge, Mich. The CADILLAC is to be used in the run between Detroit and Windsor, Canada and will carry passengers and automobiles. On the same day that the ferry went overboard two deck scows for the Great Lakes Dredge and Dock Co. were also launched.

The sponsor of the launching of the new ferry was Mrs. O. R. Green, daughter of Capt Fred J. Simpson, vice president and general manager of the Detroit and Windsor Ferry Co.

The new steamer measures 214 feet from stem to stern which is 30 feet more than the LASALLE at present the largest vessel in the Windsor service. She will accommodate 75 automobiles and 2500 passengers.

Extend Barge Service

Extension of the government barge service to the Illinois river and on to Chicago by the time the state waterway is opened is predicted by Senator Deneen, of Illinois, following conferences with the Inland Waterways Corp. in Washington. Passage of necessary legislation in the present session of congress followed by a survey of the Illinois river and Hennepin canal projects during the coming summer and the enactment of further legislation next winter probably will delay the actual authorization for at least a year from the present.

Opens Cleveland Office

W. G. Bartenfeld who has a patent on a system of channel steel and plate construction for vessels has opened an office in the Rockefeller building, Cleveland. He announces that he is prepared to offer lake vessel operators designs for the use of his system of channel construction for lake vessels, barges, scows and for the rebuilding of tank tops and hoppers.

Mr. Bartenfeld is also the Great Lakes representative for the Kearfott Engineering Co., New York and the Filtrators Co. also of New York.

Terminal at Buffalo

The state of New York has appropriated $460,000 for the dredging of Erie basin at Buffalo. This it is taken to mean will hasten the construction of the proposed million dollar passenger and freight terminal for the Cleveland and Buffalo Transit Co.

Plans have been under way for some time and the land was purchased about two years ago. There is to be a terminal building and dock. The fact that the state of New York held up the appropriation for dredging the basin held up action on the C. & B. project. The completion of the plans now under way will mean a great improvement to Buffalo's waterfront.

Sole surviver of the steamer, JAMES J. COLGATE lost in 1916 Capt. J. Walter Grashaw, veteran of the Great Lakes died at Cleveland Jan. 23. The immediate cause of death was typhoid fever. In late years Captain Grashaw commanded the PROGRESS.

Carl D. Bradley 1860-1928

CARL D. BRADLEY, president of the Bradley Transportation Co. and the Michigan Limestone & Chemical Co. of Rogers City, Mich. died suddenly from an heart attack at Pasadena, Calif. March 19. The entirely unexpected passing of this outstanding lake operator came as a distinct shock to his many friends and admirers. He was an extremely modest man and avoided all possible appearance of self-laudation. The outline of his life is therefore, not a matter of record.

Anyone acquainted with most any phase of the bulk cargo carrying trade of the Great Lakes is bound to have known Mr. Bradley because he brought some strikingly new and progressive ideas to bear in the development of vessels suitable for this trade.

The story goes that Mr. Bradley some sixteen years ago while associated with a firm of New York engineers was sent to look over the possibilities of building up a business in the production and delivery of limestone. In the sixteen years that have elapsed this business has grown to large proportions. During 1927, 14,033,376 net tons of stone were carried in vessels on the Great Lakes. In 1915 as far back as records seem to have been kept about three and one third million tons of stone were carried. In the development of this business, Carl D. Bradley took a leading part.

He distinctly showed his genius for progress when against much opposition he carried out his idea of a turbine electric self-unloading vessel. The first vessel of this type built under his direction was the T. W. ROBINSON completed in 1925. The operation of this vessel was in the main so successful that his plans for building a still larger vessel with similar machinery went through with practically no opposition.

The results have justified his conviction that the then existing type of unloader was not as efficient as it might be. This second turbine electric self-unloader was named the CARL D. BRADLEY for him and was completed by the American Ship Building Co. in July 1927. This vessel operated throughout last season with high efficiency and ran with regularity without experiencing any trouble. She carried a tremendous amount of stone and at a less cost per ton per mile than it had ever been carried before. She had the further distinction of breaking all records by carrying in a single cargo 15,724 tons of limestone. This is said to be the largest load ever carried on fresh water. Her own automatic unloading machinery discharged this tremendous cargo in five hours. This vessel represented the peak of Mr. Bradley's achievement and he saw her completed and operating successfully beyond even his own expectations.

It is difficult to say anything of

CARL D. BRADLEY

Mr. Bradley's personal relations with those who worked with him. Only those who had the privilege of working with him can fully appreciate his magnanimity and open-heartedness and lack of all pretention. He was cordial and pleasant and fair to all. It is certain that he was an exceptional man and that shipping on the Great Lakes has lost one of its progressive far-visioned leaders.

Quincy Miller, 82 years of age, at one time superintendent of the boiler shop of the old Cleveland Shipbuilding Co., Cleveland, died recently. Following the Civil war Mr. Miller became an engineer on the lakes. He retired from active participation in business about fifteen years ago. The American Ship Building Co. acquired the Cleveland company in 1899.

Obituaries

Capt. S. E. Meeker 1872-1928

Capt. Stephen E. Meeker, who stood for 36 hours on the bridge of the PERCIVAL ROBERTS JR. during the terrific storm that raged on Lake Superior during November, 1925, and brought his ship safe to port, died Feb. 9 at his home, 1454 Orchard Grove Avenue, Lakewood, after a prolonged illness. Capt. Meeker was born Dec. 6, 1872, at Huron, O. He entered the employ of the Pittsburgh Steamship Co. in 1900 as a second mate of the steamer WILLIAM R. LINN. He was promoted master of the steamer MANOLA in 1907. Captain Meeker served continuously in the Pittsburgh line until he had to leave the steamer JOSHUA A. HATFIELD on account of illness in May, 1927, the last vessel in his command.

CAPT. S. E. MEEKER

During the storm in which he held the bridge of the ROBERTS, a passenger ship, the HARMONIC, was in distress and the passengers were rescued by a sister boat of the ROBERTS. When the ROBERTS put in dock she had to have a large number of rivets tightened, as an evidence of the storm stress she had experienced. Captain Meeker's courage and mastery of the situation brought him commendation. He served on the captains' committee of the Pittsburgh Steamship line for six years.

Survivors are his widow, Mrs. Bessie Peterson Meeker, two daughters, Miss Caroline and Mrs. J. W. Aston, and one son, Allen F. Meeker.

Capt. A. H. MacLachlan

On Feb. 29, Capt. Alexander H. MacLachlan, 66 years of age, for over thirty years a captain of the Cleveland and Buffalo Navigation Co. died at his home, Lakewood, O. He once commanded the steamer, EASTLAND on a pleasure trip when that vessel sailed from Cleveland and he was proud of the fact that he brought her safely to port with 3000 newsboys as passengers.

At one time Captain MacLachlan was in command of the old STATE OF OHIO. He was prominent in Masonic circles. He is survived by his widow, two daughters, a son, A. Douglas MacLachlan and four brothers and two sisters.

Capt. F. A. West

Capt. F. A. West, another well known and successful ship master of the Great Lakes, died on Feb. 29 at his home, St. Clair, Mich. For twenty-two years he served as a master in the fleet of the Cleveland Cliffs Iron Co. and during this entire time his accident account was less than .4 of one per cent of the valuation of the ships he commanded. He was on leave of absence during 1926 due to illness but during 1927 returned as captain of the PONTIAC remaining on her until July 22 when illness again forced him to retire. He was born at St. Clair, April 15, 1869 and first went to sea at the age of fifteen.

Made Superintendent

Succeeding Robert J. Aspin, who died recently, James A. Daniel has been appointed superintendent of the National Tube Co. ore dock at Lorain, O. Mr. Daniel has been in the employ of the National Tube Co. about thirty years and for the last eighteen years has been assistant superintendent of the dock so that he is thoroughly familiar with its operation.

Shorten Time in Port

In the recently issued Lake Carriers' annual report is an explanation of how the fleet was able to move so large a tonnage last season with the number of ships used. The average time spent in port receiving and discharging cargoes during the season of 1927 was under twenty hours, less than for any of the past twenty one seasons. Without the full fleet in service it was possible to move 90,000,000 net tons of ore and coal in a lagging season without pressure largely because of the unequalled efficiency of port facilities. It must also be borne in mind that the fleet also operated on reduced loading depths.

Chicago Iron Trade

Pig iron brokers in the Chicago district recently negotiated options on foundry iron to be shipped into the Chicago district from Cleveland or possibly Buffalo furnaces after Great Lakes navigation opens. The stiffened prices of eastern pig iron, however, with the low and stable market for pig iron in the Chicago district tends to make the movement of pig iron from eastern furnaces appear less advantageous than last season. It is considered possible that the sales of iron for boat shipment may not be closed at this time. Whether a movement of this raw material from eastern territory will develop into the important proportions of a year ago hinges on the pig iron market in eastern lake port territory in the second quarter. It is likely, however, that shipments will be made. Plans are being made also to move surplus steel scrap by boat from the Chicago district to eastern steelworks districts, particularly Buffalo. The Detroit-Buffalo scrap movement this year is expected to be heavy.

Winter Traffic Good

Transportation lines on the Great Lakes handling bulk and package freight shipments report a volume of business fully equal to the 1926-1927 winter season. Weather was generally favorable for shipping throughout the past winter. Opening of passenger lines this spring will be dependent entirely upon weather conditions. No dates have been set for the addition of passenger boats to present services. Passenger traffic is not expected to be in full swing until well into June.

Begin Lake Service

The Detroit and Cleveland Navigation Co. opened regular service between Detroit and Cleveland March 21. E. H. McCracken general passenger agent of the line has announced an extension of the Chicago division to Cleveland. There will be regular service between Chicago and Cleveland via Detroit, Mackinac Island and St. Ignace from June 26 to Sept. 3. The Buffalo and Niagara Falls division will resume service April 26, two weeks earlier than usual if weather permits.

Successor to Sproule

The Philadelphia Ocean Traffic bureau has elected Richard Weglein as its president, succeeding George F. Sproule, who has retired. Mr. Weglein is the new director of the department of wharfs, docks and ferries, Philadelphia. George W. Edmunds will continue as manager of the bureau. Officers and members of the executive committee were all reappointed.

Turbine Electric Drive in Large Yacht

The first application of turbine electric propulsion to a pleasure yacht will be made in a 263-foot vessel now being built for George F. Baker, Jr., by the Newport News Shipbuilding & Drydock Company, Newport News, Va. This yacht, to be completed in January 1929, is of the twin-screw type, designed by Theodore D. Wells, naval architect, New York, and will be equipped electrically by the General Electric Co.

A total of 2600 shaft horsepower will be used to drive the boat. Each propeller will be driven by a direct-connected induction motor of 1300 shaft horsepower at 168 revolutions per minute. Power for these motors will be supplied by two turbine generators.

All the machinery will be installed amidships. The auxiliaries at sea will be driven by power furnished from a three-unit, 150-kilowatt motor-generator set consisting of a standard two-unit induction motor generator set and a small turbine. Under ordinary operating conditions the generator will be driven by the motor with power supplied from the main propulsion generating unit but, when the main unit is running so slowly that suitable voltage will not be provided, the small turbine, direct connected to the set, will be put in operation to provide auxiliary power.

A standby auxiliary generator set will also be installed, rated 150 kilowatts and driven by a direct-connected steam turbine. This will be used principally when the main unit is shut down.

The main propeller thrust bearings will be of the General Electric spring type as installed on the four turbine electric coast guard cutters and the diesel electric coast guard cutter NORTHLAND.

Standard engine room control will be used with a telegraph system to the pilot house. The control will be so arranged that either or both motors may be driven from either or both generators.

Many New England shippers are interested in the war department announcement that no tolls will be charged for passing through the Cape Cod canal.

Electric Power Cuts Operating Costs

BY W. B. BASSETT

ALTHOUGH there were fewer vessels, of less total tonnage, ordered in the 12 months ending March 31, 1928, than during the preceding year, the application of electricity on board ship has materially increased. An analysis of marine engineering developments during this period clearly indicates that the economies realized through the use of electrified equipment are being recognized by the owners and operators of vessels of all classes.

This statement is supported by the contracts awarded during the last twelve months for the modernization of old vessels. Almost without exception the auxiliary machinery of these ships has been partly or wholly electrified, even in steam propelled vessels, while three large freighters will have their steam propulsion machinery replaced by electric drive.

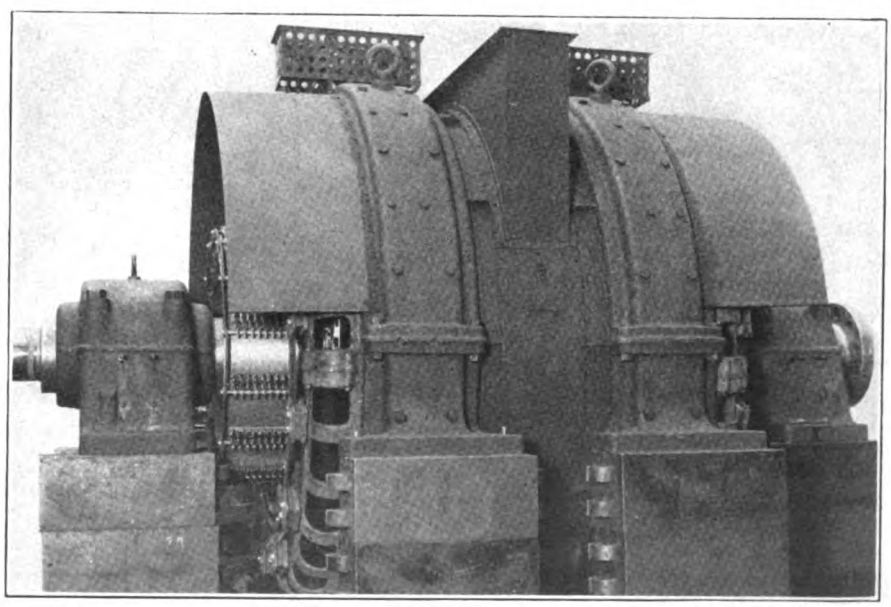
This increasing preference of the marine industry for electrical apparatus can be illustrated by the following review of Westinghouse installations awarded during the company's past fiscal year which ended March 31. This review includes new vessels and those reconditioned or converted, grouped according to the type of installation.

One of the most important types of diesel electric installation is the equipment of the three large shipping board freighters TRIUMPH, DEFIANCE and COURAGEOUS. The original 3000 shaft horsepower steam propulsion machinery and steam-driven auxiliaries of these vessels will be replaced by diesel electric propelling equipment of 4000 shaft horsepower and completely electrified auxiliaries.

This type of propulsion was selected after careful analysis of conditions to be met and results accomplished which involved an increase in speed from 10½ to more than 13 knots and the utilization of a high efficiency low speed propeller. The complete electrical equipment of the TRIUMPH and DEFIANCE will be supplied by Westinghouse.

Of almost equal importance, is the diesel electric installation of 3200 shaft horsepower with electric auxiliaries for a large tanker to be built for the Standard Oil Co. of California. This will be the highest powered diesel electric tanker in the world. The economy of operation of the port load justifies this installation in which power for the cargo pumps is taken from one of the main generators, thereby eliminating the usual auxiliary power set. Reliability in service also strongly influenced the owner in selecting this type of installation.

Other Westinghouse installations of this type of propulsion include a ferry for the Florida Ferry Co.; the



DOUBLE ARMATURE PROPULSION MOTOR OF 3200 S. H. P. FOR A NEW 13,000-TON DIESEL ELECTRIC TANKER FOR THE STANDARD OIL CO. OF CALIFORNIA

The author, W. B. Bassett, is propulsion section head for Westinghouse Electric & Mfg. Co. This article is a review of electric applications on shipboard, both for main propelling machinery and for auxiliary drives, during the fiscal year ending March 31, 1928.

auxiliary schooner yacht GUINEVERE; a river towboat for the Standard Unit Navigation Co., St. Louis; two United States navy submarines, V-5 and V-6, and a 950 shaft horsepower ferry for the Golden Gate Ferry Co. San Francisco.

In connection with the last mentioned ferry, it is interesting to note that this is the seventh diesel electric ferry that has been built for the Golden Gate company and the fourth to be equipped by Westinghouse in a year's time. The reliability and ease of control of diesel electric drive together with the saving of time lost through overhaul and repair, are strong factors in the rapidly growing popularity of this type of propulsion for ferries.

The Westinghouse company, which has pioneered in diesel electric propulsion, has received 9 of a total of 14 contracts for installations of this type awarded throughout the world during the past twelve months.

Two turbine electric installations involving engineering innovations were contracted for during the past year. These are for two large cutters for the United States coast guard and are of 3000 shaft horsepower each. The propulsion motors for these cutters are of the synchronous type, while the installations are designed in accordance with the central power station idea, whereby auxiliary power under ordinary cruising conditions is taken directly from the main turbine generator. This arrangement eliminates to a large extent the ordinarily uneconomical operation of auxiliary power sets. The speed of the cutters will be 16 knots with a propeller speed of 163.5 revolutions per minute Westinghouse, which was awarded contracts for the equipment of three similar cutters last February, will also equip these two vessels.

Geared Turbine Main Drive

An interesting geared turbine propulsion installation was awarded to Westinghouse by the Inter-Island Steam Navigation Co. This represents the complete propelling and auxiliary equipment of the WAIALEALE a new twin screw vessel of 4000 shaft horsepower, now building at the Union plant of the Bethlehem Shipbuilding Corp. Ltd. San Francisco, and which is now being equipped with high efficiency turbines of the impulse reaction type. The turbine speed of 3600 revolutions per minute, will be reduced through single pinion double reduction gears of the floating frame type to a propeller speed of 135 revolutions per minute. The turbines have a working steam pressure of 265 pounds at the throttle, with 75 degrees of superheat, while Westinghouse air ejectors of a new design will help to maintain a vacuum of 28.6 inches. A large part of this vessel's auxiliary machinery will be electrified, power for which will be supplied by two geared turbine generator sets of 100 kilowatts each.

Electrical Auxiliaries Fitted

In addition to the electrical auxiliary machinery included in the foregoing installations, Westinghouse during the past year has supplied many other vessels of various classes with electric auxiliary equipment. These vessels include several that were reconditioned and others that have direct diesel propulsion installations. This class of equipment is comprised principally of motors and control, switchboards and generators, although a fair amount of orders were received for complete auxiliary turbine generator sets.

Among the outstanding auxiliary installations are the Sun Oil Co.'s new tanker SUNOIL and the New York and Cuba Mail Steamship Co.'s reconditioned passenger vessel HAVANA. Another auxiliary contract of importance is the new direct diesel driven yacht SAVARONA, owned by R. M. Cadwalader, Jr., of Philadelphia. Thirty-three Westinghouse motors drive the auxiliaries of this large pleasure craft which, except for the propulsion equipment, is completely electrified. These auxiliaries include engine room pumps and compressors, winches, anchor windlass, steering gear and complete electrical equipment including motors and control for operating the gyro stabilizer. Westinghouse also supplied the electrical auxiliary equipment of the Gulf Refining Co.'s new tanker GULFSPRAY.

Another marine installation of considerable interest and importance is one of the largest non-propelled diesel electric suction dredges in the world. The dredge is being built by the Ellicott Machine Corp., Baltimore, and will be used on the Panama canal. The electrical equipment which Westinghouse will supply will have a generating capacity of 2200 kilowatts, and in addition to four main generators, will include a main pump motor of 2500 horsepower, a cutter motor of 350 horsepower and two motors for hoisting and hauling of 100 horsepower each.

Build Diesel for Ferry

The Washington Iron Works, Seattle, manufacturer of the Washington-Estep diesel engine, is completing an 800 horsepower, 4-cycle, 8-cylinder, full diesel engine to be installed in a new automobile ferry which is building for the Kitsap County Transportation Co. at the plant of the Lake Washington Shipyards at Houghton, Wash., near Seattle. This engine is of the solid injection type with 17-inch cylinders and 24-inch stroke. It is similar in design, although larger, to the engine built three years ago for the Ferry KITSAP. The latter is of 600 horsepower, 6 cylinders, and has given excellent service.

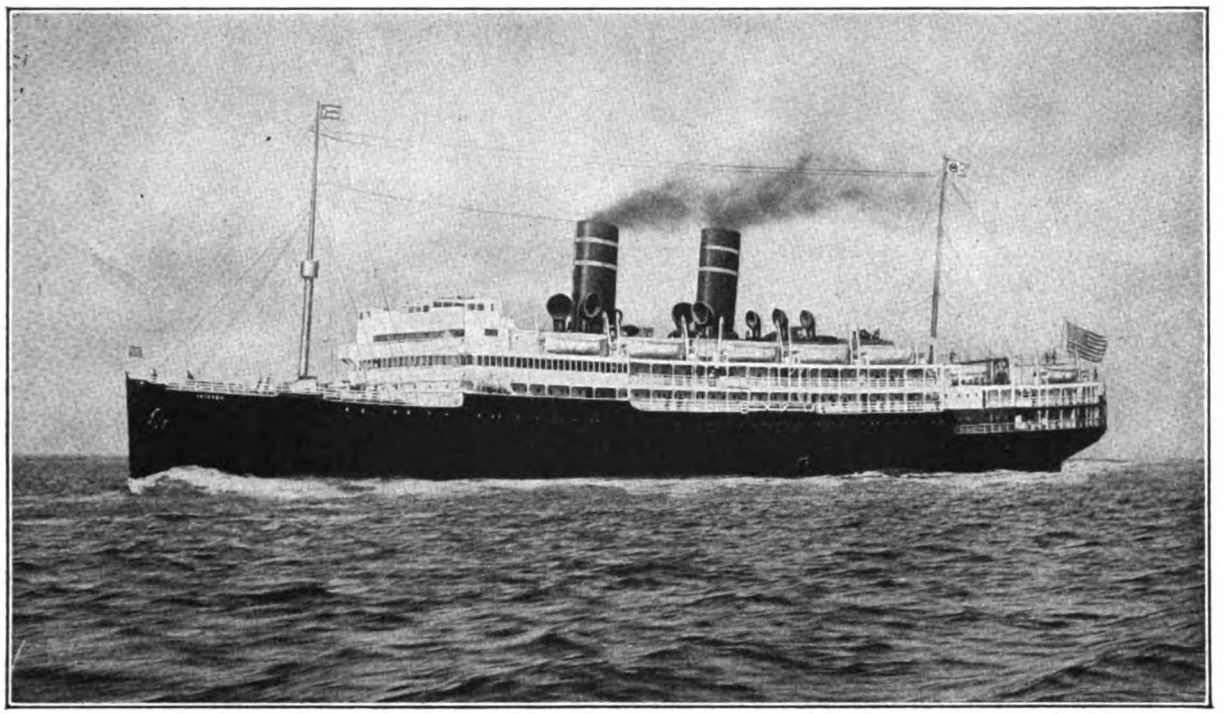
The new ferry will be of wood, 187.8 feet long, 57.8 feet molded beam and 16 feet molded depth. Its design is somewhat of an innovation as the hull is V-shaped without knuckles and with straight angles. The new design is proposed by Capt. J. L. Anderson, superintendent of the transportation company, and a pioneer in ferry operation on this coast. It will give not only increased strength but is cheaper as it involves less bending and fitting. The framing is 7½ x 9½ inches spaced 18 inches between centers with two longitudinal trusses. An extra heavy keel, 19½ x 19½ inches, is being used. The vessel will be double ended with capacity for 75 to 80 autos. She will be used in Puget sound waters and will be ready for service at an early date.

Two Diesel Ferries

It is proposed by the Hudson River Navigation Co., operator of the Night line between New York, Albany and Troy, that two diesel driven vessels be constructed especially designed to carry automobiles, passengers and freight on the Hudson. For this purpose the company applied to the shipping board for a loan of $733,000 or one-half of the contemplated cost. The vessels are to be of all steel construction with a length of 325 feet; breadth, 52 feet; depth 12 feet and with a speed of 16 knots. Combined, the two vessels will have a carrying capacity of 600 cars and will be able to make the 150-mile trip from New York to upstate points in less than ten hours.

Matson Line To Build

It is reported that the Matson Navigation Co. is planning three new passenger liners at a cost of $5,000,000 each. These vessels are to be built for the run between San Francisco and Sydney. They are to have accommodations for 350 first class, 250 second class and 7000 tons of freight.



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Shipbuilding Declines

(*Continued from Page* 73)

United States navy yards compete with the private shipyards for the work of constructing naval vessels and reconditioning shipping board vessels. This competition is both disturbing and discouraging to the private shipyard. The larger private shipyards have spent millions of dollars to provide facilities for building the highest class naval vessels and prior to 1902 built all of the then modern vessels for the navy. Since that time, however, navy yards have spent and are spending in excess of $200,000,000 in the building of naval vessels. In the past seven years naval contracts to the value of $50,000,000 have been placed with private yards and about an equal volume of naval construction has been placed in navy yards. Congressional acts making appropriations for the construction of naval vessels contain restrictive clauses as to whether such naval vessels shall be constructed in private shipyards or in navy yards, but requiring them to be built in navy yards "when time and facilities permit" and such construction "would not involve an appreciable increase in cost to the government."

The shipbuilding industry has always been highly competitive and past experience has shown that the cost of construction of naval vessels in navy yards is greater than the cost of construction in private shipyards. Due to the present depressed condition of the shipbuilding industry and the highly competitive efforts of the shipyards to obtain work these restrictive provisions are fallacious and should be eliminated from naval appropriation acts.

Entirely aside from the question of cost, navy yards are essentially "naval bases" and required for maintenance of the naval fleet and for storing and furnishing supplies and equipment. In times of emergency they need all of their capacity for these purposes and have neither the time for the facilities available for new ship construction. Furthermore, money necessary to operate and maintain navy yards is derived from taxes, a part of which is paid by private shipyards. The private shipyards pay city, county, state and federal taxes from the income derived from their business and it seems hardly equitable that the navy yards should compete with an industry that helps to support the nation.

Naval contracts of the value of $50,000,000 awarded to the navy yards during the past few years, if awarded to private shipyards, would have aided them substantially and helped to maintain efficient organizations.

Finally, what are the future prospects for the private shipyard and what can be done to help the industry?

Some ships will be built for the navy. There is no prospect, however, that there will be enough of these ships built in private shipyards to provide from this source the substantial backlog which existed before the World war. The shipyards can be materially helped, however, by the navy yards discontinuing their competition and by building all naval vessels in private yards. To accomplish this substantial aid the restrictive provisions previously referred to should be eliminated from the acts appropriating money for naval construction and thereby give the navy department greater freedom and more discretion in awarding contracts.

Eliminate Cost Differential

The United States shipping board may undertake some new ship construction; this, however, is entirely problematical and cannot be depended upon as a continued source of demand for the facilities of the shipyards. There will be some construction for the domestic trade but this will not be sufficient to save the shipyards.

Private shipowners are not justified in contracting for the construction of new merchant vessels for the foreign trade in private shipyards of this country because of their higher cost than vessels constructed in foreign shipyards. The domestic private shipyards therefore cannot anticipate orders for merchant vessels from private owners for this trade unless congress provides such owners with aid to overcome this handicap of cost of construction.

The real answer to the problem is to establish a merchant marine policy that will encourage more shipbuilding for the coastal and intercoastal trade and make possible the building of vessels for the foreign trade. Bills now before congress seek to accomplish this result and congress should act favorably on them.

Compete in West Coast Orient Trade

Sale by the shipping board of 38 steel steamers involved in three services from North Pacific coast districts is evidently to be followed by a defensive coalition by the purchasers in opposition to the Dollar interests for supremacy in Pacific coast shipping.

It is no secret that the Dollar company was disappointed that the newly formed Tacoma Oriental Co. offered a better price for the seven freighters, heretofore operated by the former company, under the name of the American Oriental line. The former operator failed to impress the board with the argument that inasmuch as he had an organization in the Orient he was in better position to take care of the business under private ownership than the newly organized Tacoma group.

According to late developments, the Tacoma company and the California interests, who purchased 21 of the 38 ships, have reached an agreement with the Oregon Oriental line whereby all three companies will be handled in the Orient by agencies organized by the Oregon company. This indicates a close understanding between the three lines which is understood to involve an interchange of service as between ports both in the Orient and on this side.

The American Oriental line lost no time in replacing the freight tonnage it lost to the Tacoma group. Withdrawing five Dollar freighters, which have been operating on the intercoastal route for several years, announcement is made that freight service to the Far East will be continued without a break. No announcement has been made as to continuance of the intercoastal service although it has been stated that within a short time other freighters, better suited to transpacific trade, will be acquired.

Motor Liner Kungsholm Launched at Hamburg

The motor liner KUNGSHOLM, building for the Swedish American line for service between New York and Gothenburg, Sweden, was launched March 17 at the shipyards of Blohm & Voss at Hamburg. The christening was performed by Mrs. Axel Carlander, wife of the president of the Swedish American line. The KUNGSHOLM will make her maiden voyage from Gothenburg Nov. 24 and from New York Dec. 8.

While somewhat larger than her sistership, the motor liner GRIPSHOLM, which has the distinction of being the first transatlantic passenger motorship, the KUNGSHOLM will have the same general features. She will be powered with two double-acting eight-cylinder diesel engines, of 24,000 total horsepower propelling her at a speed of 18 knots. The vessels length is 608 feet and there will be accommodations for 250 first, 400 second and 1000 third class passengers.

S. S. America Sails

(*Continued from Page 77*)

be had. Nothing has been left undone to insure the safety of passengers.

The deck spaces of the AMERICA are truly magnificent. No traveler can help but be impressed with their spaciousness. Long sections of the promenade deck forward are glass enclosed. There is a large gymnasium completely fitted with modern equipment.

No changes were made in the machinery and the AMERICA remains a coal burner. Every part was carefully overhauled and placed in good order.

It can be said that the new AMERICA surpasses the beautiful world wide known old AMERICA but that the traditions associated with this great ship both in peace and war remain unchanged.

Yorktown Is Launched

The new bay steamer, YORKTOWN building at Newport News Shipbuilding & Dry Dock Co. for the Chesapeake Steamship Co.'s fleet was successfully launched Feb. 25. The sponsor was Miss Ruth Miller Green. A luncheon was held at the Tidewater club following the launching. A brief address was made by A. L. Stephens president of the Chesapeake line.

The YORKTOWN now nearly completed will replace the CITY OF ANNAPOLIS in the service between Baltimore and West Point. In general characteristics she is similar to the CITY OF RICHMOND now operating on that run. Her length over all is 277 feet 3 inches; length between perpendiculars, 267 feet; beam, 46 feet at the water line and 53 feet over guards; depth, 18 feet to the main deck. The draft will be 13 feet. The Isherwood system of longitudinal construction has been used. The ship is classed under the American Bureau of Shipping.

The engine is of triple expansion type with high and intermediate cylinder diameters 23 x 39 inches and two 47-inch diameter low pressure cylinders with a 40-inch stroke. Steam, at 190 pounds pressure per square inch, will be furnished by four, three furnace single ended, scotch boilers, 14 feet in diameter and 11 feet 4 inches long, using coal as fuel.

Galley equipment will be complete and the dining room will be light and cheerful. The staterooms are well heated and lighted and will be furnished with the conveniences of a first-class hotel, many having attached bathrooms or showers and all supplied with hot and cold fresh water.

Proposed Big Dry Dock

There has been considerable agitation recently, which culminated at a public hearing before the Port of New York authority, on the building of a big dry dock to serve the Port of New York. This dry dock, it is proposed, should be large enough to accommodate any ship afloat and any ship which might be projected in the future. The project it is thought would cost about $5,000,000 and federal and state aid is suggested.

The necessity for such a dry dock for New York, if the port is to be entirely self-contained, seems clear but it was pointed out that only a few vessels were unable to obtain dry dock accommodation in private yards in New York now and of these vessels only three were under the American flag. There would be no chance, according to practical repair yard operators, to get the work and dry docking on the large foreign ships except in cases of absolute emergency. The Commonwealth drydock, Boston, is capable of docking the largest ship afloat. Under present conditions and considering the comparatively slight call made on the Boston dock it does not at this time seem warranted to go in for this expenditure from a commercial point of view. If the federal and state governments cooperated in financing such a drydock it would undoubtedly be of considerable advantage to the port.

Harbor Tanker Launched

A tanker built for Riley and Kendall, the J. NORMAN RILEY fitted with twin screw diesel drive was launched Feb. 29 at the yard of Jakobson and Peterson Inc., Brooklyn. The tanker will be used for the harbor transportation of petroleum products. She is 128 feet long, 28 feet 6 inches in beam and has a cargo capacity of 100.000 gallons and a draft of 7 feet 6 inches. Her cargo can be discharged in 1 hour and 40 minutes by means of two 5-inch rotary pumps. In this way shallow waterways can be entered on the high tide and cargo discharged giving the vessel a chance to return on the same tide.

An Interesting Venture

The second vessel, the CITY OF ROUBAIX, a 7100 gross tons turbine driven freighter, one of three in a most interesting experiment being carried out by the Ellerman line, recently passed her official trials off the Tyne. This company has set out to build three similar vessels with different types of motive power, to determine in practical service which is the most efficient. The first vessel of the three, the CITY OF CANBERRA, has quadruple expansion reciprocating engines and the third, the CITY OF LILLE, is to be equipped with diesel engines. The CITY OF ROUBAIX is fitted with scotch boilers, operating at 300 pounds pressure, and with preheated air, electric auxiliaries, and Parsons geared turbines.

Importance of Speed

It is quite possible that in the Swedish passenger and motorship, MIRRABOOKA, built by the Transatlantic Steamship Co. of Gothenburg, for the wool trade between Australia and Europe, we have an example of the ideal long distance cargo ship of the near future. Once the shipper gets used to express freight service the demand for it will continually increase. The new motorship referred to has a speed of 15 knots and has accommodations for 30 passengers. In the off season, under the management of the General Steamship Corp. as agents for the line, the MIRRABOOKA will be used in the direct California-Australia service.

Equalize Port Rates

Of utmost importance to New England manufacturers and to the port of Boston is the resolution recently adopted by the United States shipping board for equalization of through land and water rates from United States to Europe. This appears to be the most important step in the direction of placing competing eastern ports on an equal basis, that has been taken since the port of Boston filed its initial complaint in 1921. Before the war the ocean rates from Philadelphia, Baltimore and Norfolk to European ports were enough higher than the rates from New York and Boston to make the through rates by rail and ocean from interior points exactly the same. This enabled a shipper in Chicago, for example, to route his freight through any of the North Atlantic ports on exactly the same basis of rates. As a result of war conditions the ocean rates were equalized with resultant disadvantage to Boston and New York. Today a shipper in Chicago must pay more to send his European bound goods through Boston or New York than through Baltimore.

A contract for building three steel lightships for the government has been awarded to the Albina Marine Iron Works for about $500,000.